

September 2002
**ECONOMIC AND
REVENUE
FORECAST**

FISCAL YEAR 2003
1ST QUARTER



WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

Cover photo: Irrigated vineyards have potential to become an increasingly important source of revenue from state-owned lands managed by the Washington State Department of Natural Resources

September 2002 ECONOMIC AND REVENUE FORECAST

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September 2002

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The quarterly revenue forecast is a collaborative effort. It is the product of information provided by private individuals and organizations, and DNR staff. Without their contributions this forecast could not be completed.

An absolutely critical component of this forecasting work are the purchasers of DNR timber. These busy individuals and companies willingly provide information that is essential to the process of estimating harvest volumes.

Many DNR staff also contribute to the forecast. Those persons who provide data or forecasts of revenue flows for their areas of responsibility make an especially significant contribution. These people include John Luedecker, Paul Penhallegon, Rod Rennie, Mark Savage, Bob Suda, and Jon Tweedale. Also, other DNR staff have provided valuable and constructive feedback on drafts of this forecast report, and I thank Phil Aust, Dave Larsen, Quynh Nguyen, Jim Smego, and Bob van Schoorl for their comments in this regard.

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Bruce P. Glass
September 30, 2002

PREFACE

This forecast projects revenues from Washington state trust lands managed by the Department of Natural Resources. These monies are distributed to accounts associated with specific management activities and the trust lands from which revenues are expected to be generated. The department projects revenues quarterly to provide information for trust beneficiaries as well as for long-term budgeting purposes.

This forecast covers fiscal years (FY) ending June 2003 through June 2007. The baseline date for this September 2002 forecast is June 30, 2002, the end of FY 2002. While sales and revenue data are current as of this date, the forecasts are based on the most up-to-date data available at the time of their estimation (i.e., after the baseline date). Macroeconomic and market outlook data are the most up to date available at the time the forecast was written.

Unless otherwise indicated, values are expressed in nominal terms, without adjustment for inflation. Interpretations of trends in the forecast therefore require care in separating inflationary changes in the value of money over time from changes attributable to other economic influences.

FORECAST CALENDAR

The forecast calendar for future DNR Economic and Revenue forecasts is shown in the table below. The DNR forecasts provide information that is used in the state-wide Washington Economic and Revenue Forecasts carried out by the Office of the Forecast Council. The timing for the DNR forecast is therefore determined by the schedule of the state-wide forecast, prescribed by RCW 82.33.020. The calendar prescribed by RCW 82.33.020 is reflected in the release date, i.e., when preliminary revenue forecast estimates will be available. Publication of the actual forecast document follows at a later date.

Forecast title	Baseline date	Release date	Publication date (approx.)
November 2002	End Q1, FY 2003	November 22, 2002	November 29, 2002
March 2003	End Q2, FY 2003	March 21, 2003	March 28, 2003
June 2003	End Q3, FY 2003	June 20, 2003	June 27, 2003
September 2003	End Q4, FY 2003	September 19, 2003	September 26, 2003

EXECUTIVE SUMMARY

- The US economy is delicately poised, with the current slowdown in economic activity being drawn out for longer than initially envisaged. Consumer spending, coupled with tax refunds and timely anticipatory interventions by the Federal Reserve Bank, have mitigated the various shocks affecting the economy recently. However, consumer confidence remains a key factor that will determine, through its effects on consumer spending, the eventual duration of the current slowdown. Ironically, these economic conditions are encouraging the current consumption of wood products since historically low interest rates are increasing housing affordability, and because investors are presently seeking investment alternatives outside the stock markets (often in the form of real property). These effects are expected to drive wood consumption in the near to medium term also, but increasing timber supply and the ready availability of substitute products means that demand strength is unlikely to be translated into significant price increases.
- The baseline date for this forecast is the end of Fiscal Year (FY) 2002, i.e., June 30, 2002. Data extracted from the department's management information systems and presented in this forecast are current as of that date. Other data used in the forecast, especially those used in describing the economic backdrop and those data used specifically for forecasting purposes, are the most up-to-date available at the time the forecast is actually compiled.
- Total revenues from all DNR management activities (upland and aquatic, excluding trust land transfer payments) are forecast to increase from about \$188 million in FY 2002 to reach \$201 million in FY 2003. Revenues are then forecast to decrease to \$187 million in FY 2004 before rising through the remainder of the forecast period to reach about \$221 million in FY 2007. The overall trend in revenues reflects anticipated fluctuations in timber supply, construction activity, timber sale volumes and prices, and projected timber removals.
- In accordance with total revenues, trust beneficiary revenues are forecast to increase from about \$140 million in FY 2002 to reach over \$149 million in FY 2003. Revenues are then forecast to decrease to \$139 million in FY 2004 before rising through the remainder of the forecast period to reach about \$165 million in FY 2007. Changes in these revenue forecasts compared with the June 2002 forecast reflect the changes and trends in total revenues mentioned above.
- In accordance with total revenues, management fund revenues are forecast to increase from about \$48 million in FY 2002 to reach \$51 million in FY 2003. Revenues are then forecast to decrease to \$48 million in FY 2004 before rising through the remainder of the forecast period to reach about \$56 million in FY 2007. Changes in these revenue forecasts compared with the June 2002 forecast reflect the changes and trends in total revenues mentioned above.

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- Timber removal revenues comprise the bulk of DNR's revenue earnings. In line with anticipated trends in timber sale volumes and prices, and timber removal volumes, removal revenues are forecast to increase from about \$151 million in FY 2002 to \$161 million in FY 2003. Revenues are then forecast to decrease to about \$145 million in FY 2004 before rising through the remainder of the forecast period to reach about \$169 million in FY 2007.
- Overall, revenues from non-timber activities are small and relatively stable compared with timber revenues. However, non-timber revenues are forecast to grow at substantially higher rates than in the previous June 2002 forecast (from nearly \$22 million in FY 2002 to over \$32 million in FY 2007), on the back of changes in business practices aiding the repositioning of existing nontimber income-producing assets into more productive situations. Commerical real estate is expected to be a major contributor to this revenue stream.
- Aquatic revenues are expected to increase from nearly \$16 million in FY 2002 to nearly \$19 million in FY 2007. Geoduck clams and water-dependent leases are forecast to be the most rapidly growing sources of aquatic revenue. However, proposed legislation regarding setting rents for marinas on state-owned aquatic lands may have the effect of reducing revenue from these types of water-dependent leases.
- Major factors contributing to the uncertainty surrounding this September 2002 forecast include: (1) the outcome of legal challenges to timber sales offered by the department; (2) impacts on timber sale volumes of both changes in business practices and re-estimation of the sustainable harvest level for lands managed by the department; (3); impacts on domestic (US) log prices of restricting exports of softwood lumber from Canada into the USA; (4) military tensions in the Middle East, and their possible consequences (e.g., an expanding federal government deficit on account of increased defense expenditures, increasing oil prices slowing economic activity); (5) interest rate movements in response to inflation and growth trends in the U.S. economy; and (6) future trends in consumer spending, particularly as influenced by consumer confidence.

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ECONOMIC BACKGROUND

US Economy¹

Recovery in the US economy has weakened somewhat. The current slowdown is proving more protracted than originally anticipated, and the risk is that it will lengthen further. The Federal Reserve Bank (FRB) recognizes the potential for further slowing of domestic economic activity, but has yet to adjust monetary policy through the interest rate channel. Fortunately, inflation remains firmly under control (1.6% for 2002 and 2.4% for 2003 according to consensus estimates; Blue Chip Economic Indicators, 2002), providing the FRB with leeway to reduce rates if necessary.

Productivity growth has also buoyed up the economy over the last year (and more!), driving income growth and offsetting the impact of increases in unemployment. Consequently, real (i.e., inflation-adjusted) consumer spending has remained a major factor mitigating the recent weakness observed in the US economy, aided by timely FRB interest rate reductions and tax refunds. In particular, historically low interest rates have boosted consumer spending by releasing home equity and reducing mortgage payments.

The US trade deficit has expanded rapidly since 1997, and a consensus view among economists is that this deficit will continue to grow through 2002 and 2003 (Blue Chip Economic Indicators, 2002), though perhaps at a slowing rate. Resource Information Systems, Inc. (RISI) argues that the trade gap will not shrink appreciably unless the US dollar depreciates substantially. Signs are now emerging that, in the wake of a relatively weak domestic economy and declining investor confidence brought on by corporate governance concerns, a depreciation of the US dollar (real, trade-weighted basis) has probably started, ending a 7 year appreciation phase. The unwinding of the trade deficit will depend upon how far and how fast the dollar slides, and on the pace of domestic economic growth. RISI anticipate a 20% currency depreciation, and forecast that the trade gap will diminish both in absolute and relative (to GDP) terms from about 2004 onward through 2007.

These macroeconomic conditions are reflected in the consensus outlook for growth in real gross domestic product (GDP). While real GDP growth slowed in the second quarter of 2002, consensus forecasts of annual real GDP growth presently stand at 2.3% for 2002 and 3.2% for 2003 (Blue Chip Economic Indicators, 2002). These estimates of growth estimates are encouraging signals that the economy remains on the road to recovery, even though other indicators might suggest the road to economic recovery may provide something of a bumpy ride. For example, indices of consumer and business confidence are showing signs of flagging, particularly in the wake of recent corporate accounting scandals. Ironically, the perceived state of corporate governance may well be contributing to the recent strength observed in home sales and new housing starts (along with affordability, of course). Residential rather than stock market investment could well be a logical outcome of the recent bearish performance of the stock markets, coupled with doubts about how company accounting practices might--or might not--be influencing public statements of asset values. In

¹ Years in the 'Economic background' section refer to calendar years (ending December). Elsewhere and unless otherwise indicated, years refer to fiscal years (ending June).

the longer term however, corporate profitability will remain a key driver of consumer confidence and therefore expenditures.

At present, mortgage interest rates are near 30-year lows, partly as a consequence of the FRB interest rate cuts of 2001. Given the lag times involved (some 6 to 18 months), it seems unlikely that the full effects of the rate reductions carried out in 2001 have yet to be fully experienced in the economy at large. When coupled with the recent FRB notice that its next rate change is more likely to be another cut rather than an increase, the outlook for mortgage rates is that they are likely to remain at these relatively low levels for some time to come. Clear Vision Associates (CVA) forecasts mortgage interest rates (for a 30 year fixed interest rate, 20% down payment) to increase from an average of 7.2% in 2002 to 7.3% in 2003, before declining through 2004 to a low of 6.5% in 2005. RISI predicts that, on average, mortgage rates will remain at about 7.1% over the forecast period (effective conventional mortgage average of adjustable and fixed rates). However, currently 30-year mortgage rates are closer to 6%: the Federal Home Loan Mortgage Corporation (Freddie Mac) and the Federal National Mortgage Association (Fannie Mae) were both reporting yields of 5.93% and 5.98% on 30-year mortgages (delivered within 30 days) as of August 23, 2002 (Wall Street Journal, 2002).

Certain other risks face the US economy also. These include:

- Misjudgment by the FRB of inflationary pressures in the domestic economy, and the appropriate monetary policy response. (A difficulty the FRB faces in determining the appropriate response involves assessing the impact of its interest rate manipulations, because there is a six to 18 month lag before a response can be observed. This lag creates uncertainty.)
- Delayed recovery of corporate profitability leading to further lay-offs of employees, and denting consumer confidence to the extent that real consumption expenditures decline, and the US economy tilts back into recession (the 'double-dip' scenario).
- Military tensions in the Middle East, and their possible consequences, e.g., further increases in oil prices eventually slowing economic activity; an expanding federal government deficit on account of increased defense expenditures, resulting in upward pressure on interest rates and appreciation of the US dollar.
- Potential impacts of increased protectionism on (medium- to long-term) domestic economic activity, including both intended and unintended impacts.

US Solid Wood Consumption

Housing starts are widely regarded as a leading economic indicator, and since they are also somewhat interest-rate sensitive, changes in interest rates resulting from FRB interventions will eventually tend to feed through into residential construction activity, i.e., the main end use for solid wood products in the USA. For the wood products industry, a beneficial effect of the FRB interest rate cuts has been that the house construction sector has exhibited considerable

resilience in the face of the slowdown observed elsewhere in the economy, partly on account of declining mortgage interest rates stimulating new housing and mortgage refinancing, and partly because at present housing appears to be regarded as a less risky investment alternative than, say, the stock market. However, should consumer confidence be undermined and result in reduced consumer expenditures, residential house construction could well slow also.

These favorable housing market fundamentals are reflected in relatively high (by recent historical standards) forecasts of housing starts. CVA predicts housing starts to increase through 2002 from a seasonally-adjusted rate of 1.60 million units (excluding mobile homes) in 2001 to a peak of 1.72 million units in 2003. CVA then forecasts housing starts to decline to 1.64 million units in 2004 and rise through 2005 to reach 1.80 million units in 2006. Like CVA, RISI is also optimistic regarding new housing starts, and forecasts starts of about 1.67 million units in 2002 and 2003, rising to a peak of 1.75 million units in 2004. Other commentators expect housing starts to be higher in 2002 than in 2003. One consensus survey of economic forecasts anticipates new housing starts will reach 1.65 million units in 2002 and 1.60 million units in 2003 (Blue Chip Economic Indicators, 2002). Another consensus survey (reported by CVA), and the National Association of Home Builders project 2002 starts of 1.63 million units, and 2003 starts of 1.59 million units. The National Association of Home Builders estimates starts at 1.63 million units for 2002, and 1.59 million units for 2003.

Aside from new housing, residential upkeep is the other major component of softwood lumber consumption. CVA anticipates real expenditures on residential additions and alterations for 2002 and 2003 to be about \$105 billion (seasonally adjusted 1996\$), up from \$98.4 billion in 2001. CVA then forecasts these expenditures to slip to just under \$100 billion in 2004, before rising strongly through 2005 to reach \$108 billion in 2006. RISI forecasts real repair and remodeling (R & R) expenditures to decline from about \$135 billion (seasonally adjusted 1996\$) in 2001 to \$132 billion in 2002, before rising through 2003 to a peak of nearly \$144 billion in 2004.

Interaction Between the US and Selected Foreign Economies

Forest products are internationally traded commodities, and although sawtimber purchased from land managed by the Washington State Department of Natural Resources (DNR) by law cannot be exported in unprocessed form, the department still faces impacts indirectly related to economic and market conditions in foreign countries. The department experiences these impacts primarily as consequences of the responses of firms in the US forest and wood products sectors

Japan has been the major market for North American exports of softwood logs, lumber, and wood chips.



that are directly exposed to these conditions. The department also experiences impacts related to trade policies governing trade in forest products.

Japan and Canada are the main foreign countries influencing the US forest products economy. In general, Japan is the major export market for US (and North American) forest products, particularly logs and lumber. Canadian firms are the major competitors faced by US forest products firms, both in the domestic US market and in the Japanese export market, and especially in the lumber markets in both countries. However, competition from European lumber suppliers is increasing, both in Japan (see pages 12 and 13) and in the USA.

- **Japan**

For a brief while, it looked as though the beleaguered Japanese economy was going to ride substantially higher than it has in recent years, on the back of an export-led recovery. That perception, however, is proving illusionary in the face of slowing economic activity in many of its major export markets (Asia, the USA, and Europe). Many of the issues that were obscured to some degree by the upsurge in the export sector of the Japanese economy are coming back into focus again, particularly the need for enacting (long overdue) structural economic reform. Unfortunately, political conditions still do not seem to favor implementing such reform. Furthermore, Japan is captured within the clutches of a deflationary spiral, where consumers ask themselves "Why buy today, when tomorrow it will be cheaper?" Since consumer expenditures account for some 60% of GDP in Japan, deferred consumption decisions have serious consequences for real GDP growth.

These conditions are reflected in real GDP growth forecasts. Estimated real GDP growth rates were 2.4% in 2000 and -0.4% in 2001. From these levels, RISI also expects negative (-1.5%) real GDP growth in 2002, picking up through 2003 and 2004 to reach 1.7% in 2005. CVA shares a similar view of recovery in the Japanese economy, estimating 0.2% real GDP growth in 2002, rising through 2003 and 2004 to reach 1.8% in 2005. Results from an August 2002 survey indicated consensus estimates of real GDP growth in Japan for 2002 and 2003 were -0.4% and 0.8% respectively (Blue Chip Economic Indicators; 2002).

Forecasts of lackluster GDP growth are also reflected in forecasts of Japanese housing starts. CVA forecasts a decline over virtually the entire forecast period from 1.18 million units in 2002 to 1.07 million units in 2006. RISI forecasts housing starts will decline slightly from 1.17 million units in 2001 to 1.14 million units in 2002, before recovering through 2003 to 1.25 million units in 2004. A consensus position reported by CVA is for housing starts to reach 1.15 and 1.16 million units in 2002 and 2003 respectively.

- **Canada**

Trade policy can give rise to unintended consequences and the recently imposed duties on softwood lumber exported from Canada into the USA is no exception. In the

short term, the duties may increase softwood lumber prices in the US (though this does not appear to have been the case so far (see page 13). However, in the long term DNR and other sawtimber growers are unlikely to benefit from these duties. In effect, the duties make it harder for Canadian firms to export lumber to the US market, particularly while the Japanese market remains tightly competitive and/or in the doldrums. These circumstances then make it easier for the Canadian firms to make the case for exporting logs under the Canadian log export regulatory regime, and these logs may then become potentially available for purchase by Washington and Oregon firms. (Refer to the June 2001 forecast for a discussion of increased exports of Canadian softwood logs in the context of the SLA; Glass, 2001.) As the potential availability of these Canadian logs increases, then Washington and Oregon bidder interest in DNR sales may well diminish, and the timber sales prices the department receives may decline on account of the reduced bidder competition.

An additional impact on the domestic sawmilling industry--and, ultimately, domestic producers of sawtimber--could be that the duties force Canadian lumber manufacturers to invest more heavily in value-adding processing in order to retain access to the relatively lucrative US market. In so doing however, domestic processors risk losing market share (and sacrificing long-term profitability) to competing Canadian firms, again potentially adversely affecting prices of domestic stumpage and logs.

MARKET OUTLOOKS

Softwood Sawtimber Supply²

Washington State Department of Natural Resources is a major seller of standing timber in the western USA. Prices received for timber sold by the department depend in part upon harvest levels and standing timber inventories within both this western US region (and especially in the Pacific Northwest), and other major North American softwood producing areas, principally British Columbia (BC) in Canada, and the US South.

Softwood sawtimber harvest in the western USA has declined markedly from a peak of 24.5 billion board feet (bbf, International 1/4-Inch scale³) in 1987 to 11.3 bbf in 2001. This decline is largely attributable to reduced timber harvests from public (National Forest) and private lands, stemming from government policies, listing of species under the Endangered Species Act (ESA) and, to a lesser extent, the age class distribution of the resource (especially on private land). RISI forecasts a continuing, though substantially slower, decline in total sawtimber harvest in the western USA to 10.2 bbf in 2006. CVA predicts softwood sawtimber harvests in Washington to be fairly flat over the 2002-2006 period, averaging nearly 4.3 bbf/year (Scribner log rule; estimated 3.8 bbf in 2001). CVA expects harvests in Oregon also to remain flat over this same period, averaging about 3.8 bbf/year (Scribner log rule).

From about the mid 1980s, an increasing proportion of the softwood sawtimber harvest in the western US has been sourced from private lands. According to RISI, the share of the softwood harvest from private land in the western US region has increased from about 48% in 1987 to over 82% in 2001, but the rate of increase is expected to slow markedly over the 2002-2006 period (reaching 84% by 2006). However, RISI's estimates assume no further large changes in harvest from public lands. Under the Bush administration, significant changes are starting to appear in US federal timber policy that have implications for (public) timber supply. For example, the Bush administration has indicated a desire to establish thinning programs for maintaining forest health and for fire suppression purposes, a change that, if implemented, would increase the supply of small diameter logs in particular. Factors offsetting a potentially expanding timber supply in the western US are impacts associated with listings under the Endangered Species Act (ESA), increased regulation by government agencies, and continued pressure from environmental groups.

British Columbia (BC) accounts for a large proportion of Canada's total timber production, about 43% according to RISI. RISI estimates BC sawtimber harvest will decline from an average of about 16.5 bbf/year over the 1990-97 period to 15.5 bbf/year from 2002-2006. CVA foresees a fairly flat harvest over the 2002-2006 period, averaging about 14.1 bbf/year (Scribner log rule; estimated 13.7 bbf in 2006). However, prospects for future timber harvest in BC are somewhat ambiguous. A large proportion of the harvest is sourced from public lands, and is therefore subject to environmental and regulatory pressures similar to those

² Sawtimber refers to tree or logs of sufficient size (generally greater than 4 inches inside-bark diameter) and quality that allows them to be processed into lumber.

³ Unless otherwise stated, sawtimber volume in this section is expressed in terms of this log rule. Elsewhere in the report, the Scribner log rule is used.

facing the western US resource. On the other hand, massive infestations of mountain pine beetle in inland BC are focussing attention on salvage logging dead and dying trees while they remain merchantable. In the final analysis though, the driving factor for future timber harvests in BC is likely to be competitiveness in the Japanese and US softwood lumber markets. Further harvest reductions are likely as a consequence of increasing competition in a soft Japanese lumber market and trade policy restricting softwood lumber access to the USA (see pages 4, 5, 12 and 13). Offsetting to some degree these potential BC harvest impacts will be increased log exports from Canada to both the USA and Japan.

Softwood timber harvest in the southern USA has declined from a peak of 18.7 bbf in 1988 to 13.8 bbf in 2001. RISI predicts timber harvest in the US South will decline further to 12.4 bbf by 2006. RISI ascribes this decline to the underlying age-class distribution of the southern timber resource rather than changes in national timber policy and/or increasing environmental regulation (although environmental regulation is a potential factor that may also limit southern timber supply).

From DNR's perspective, this softwood sawtimber supply outlook is not particularly favorable. Depressed softwood lumber market conditions in Japan and trade restrictions on Canadian softwood lumber exports to the USA will tend to make Canadian softwood logs more readily available to sawtimber purchasers in Washington and Oregon. These purchasers might otherwise have been more inclined to purchase sawtimber from DNR-managed lands.

Softwood Sawtimber Demand

Sawtimber demand is primarily expressed as a demand from mills for log inputs, either as logs or standing timber. However, demand for sawtimber is really a derived demand, being driven by demand for the main products derived from sawtimber, i.e., export logs, lumber, plywood, and wood chips.

- **Lumber**

A steadily rising trend can be observed underlying cyclical fluctuations in total US softwood lumber consumption data spanning the 1976-2001 period. This trend is expected to continue. CVA views consumption as increasing through 2002 from 54.3 bbf in 2001 to a cyclical peak of 59.1 bbf in 2003. CVA then forecasts consumption to decline to 56.8 bbf in 2004 before rising again through 2005 to reach 60.9 bbf in 2006. RISI shares a similar view, but with a lag: they anticipate consumption rising through 2002 and 2003 to a cyclical peak of 58.1 bbf in 2004, before declining through 2005 to a low of 52.9 bbf in 2006.



New residential housing remains the largest end-use for softwood lumber in the USA. In 2001, new housing (including mobile homes) consumed 19.4 bbf of lumber (36% of total consumption), compared with 16.2 bbf for R & R (30%). RISI forecasts softwood lumber consumption in both new housing and R & R uses as increasing from 2001 levels through 2002 and 2003 to a high of nearly 39 bbf in 2004. CVA estimates US softwood lumber consumption for residential construction will total 40.9 bbf in 2002 and 42.0 bbf in 2003 (a split of about 56% used in new homes and 44% in R & R).

The other main end uses for softwood lumber in the US are nonresidential construction and industrial production (e.g., furniture production, pallets and crates, etc.). According to RISI, in 2001 about 2.5 bbf and 12.6 bbf of softwood lumber was consumed in each of these two end uses respectively. RISI estimates softwood consumption for nonresidential construction will increase from these levels through the forecast period to reach levels of about 2.7 bbf and 13.3 bbf in 2007. CVA forecasts nonresidential consumption of softwood lumber to total 16.1 bbf in 2002 and 17.1 bbf in 2003.

- **Structural Panels**

Structural panels include plywood and oriented strand board (OSB). Plywood is manufactured from sawtimber-sized logs, whereas OSB is manufactured from (flaked) wood chips and does not require as high a quality log input as does plywood manufacture. In terms of end-use, OSB is being used more and more in many of plywood's traditional uses in residential construction, and in other uses at the expense of solid wood (e.g., use of I-beams for structural purposes). Because Washington state is a major source of Douglas fir plywood (much of it manufactured from the relatively high quality, large logs sourced from DNR-managed lands), and there is little OSB production capacity in the Pacific Northwest (which could otherwise provide a market outlet for timber from DNR-managed lands), replacement of plywood by OSB in the structural panels market is likely to negatively impact the department's timber sales revenues. Specifically, the release of log volume from plywood production is and will continue to be (for reasons outlined below) a source of downward pressure on timber sales (and lumber) prices.

Competition for market share in the structural panels market remains intense, as plywood manufacturers struggle to maintain market share in the face of expanding low production cost OSB capacity. On the supply side, further OSB capacity expansion is anticipated in North America over the forecast period: according to RISI, OSB capacity in the USA will increase from 13.2 bsf in 2001 to 17.3 bsf in 2007. Ongoing substitution of plywood by OSB, particularly in residential construction applications, will reduce plywood domestic market share from 42% in 2001 (15.1 bsf) to 33% in 2006 according to CVA, down from a 76% share in 1990 (20.9 bsf). Comparable estimates from RISI put plywood market share at 44% in 2001 declining to 32% in 2007 (13.3 bsf).

- **Engineered Wood Products**

Engineered wood products (EWP) are gaining an increasingly large foothold in markets dominated by softwood lumber. The inherent advantages of these products are performance and cost. Their performance advantage arises because EWPs tend to have less variability compared to solid wood, imparting performance consistency, reducing design margins, and opening up new applications (e.g., wider spans). The cost advantage of these products ultimately lies in their manufacture from a lower cost raw material feedstock compared with solid lumber, and their ease and lower (primarily labor) cost of installation. In short, EWPs are proving an efficient use of wood in many applications.



Outside the structural panels market, the main EWPs are the wooden I-beam, and laminated veneer lumber (LVL). Wooden I-beams take their name from their cross-section: it looks like a capital 'I', with a central vertical (termed 'web') component often made of OSB, and upper and lower flanges manufactured of solid wood or, increasingly, LVL. Like plywood, LVL is manufactured from veneer, but the veneer is laminated in the form of a solid wood member, rather than as a panel. Of these two types of EWPs, substitution away from solid wood towards I-beams is likely to have the greatest impact on the department.

On-going substitution of EWP for solid wood members is anticipated through the 2002-2007 forecast period, mostly for new residential construction and R & R end uses. According to RISI, demand for I-beams is forecast to grow at an average annual rate of some 3.8% per year through 2007 from 834 million linear feet in 2001. The comparable figure for LVL is 4.3% per year, from 28.1 million cubic feet in 2001. Another factor driving demand is usage rate; usage rates for EWP are expected to increase substantially over the forecast period (i.e., quantity used per unit construction). On the supply side, excess capacity in the North American I-beam and LVL industries is also expected to be a major factor driving substitution away from solid wood to EWPs, despite anticipated demand improvement. In addition, tariffs on softwood lumber imported from Canada, possibly coupled with a favorable exchange rate, will provide an incentive to manufacture EWPs in Canada for export to the USA, to the potential detriment of domestic EWP and softwood lumber producers.

- **Wood Chips**

Wood chips are used mainly in manufacturing wood panels (both structural and nonstructural), and pulp and paper products. Wood chips are obtained from two major sources: (a) as a by-product of lumber and plywood manufacturing; and (b) directly from

pulpwood (roundwood). Chips sourced from pulpwood are a relatively small component of raw materials demand in the western USA, and softwood manufacturing residues provide the bulk of the chip supply. Since reconstituted panel mill capacity in the western USA is relatively low, most of these chips are either supplied to pulp mills in the region or exported.

The amount of chips available as a by-product of lumber and plywood manufacturing depends upon mill capacity, production levels, and conversion efficiencies. In the western USA, both CVA and RISI forecast increases in residue availability over the forecast period, as lumber production increases (and more than offsets anticipated declines in plywood production in the region). Both RISI and CVA expect roundwood pulpwood production in the western USA to remain fairly flat over the 2002-2006 period.



Barging is a commonly used means of transporting wood chips produced from lumber and plywood mill residues to pulp and paper mills in western Washington.

At present, pulp and paper markets are weakening in concert with a slowing US (and global) economy, and mills are curtailing production, thereby reducing demand for wood chips. Even given a recovering pulp sector in 2003 and 2004, there will probably be residual wood chip supply, particularly if the increased pulp production makes greater use of recovered paper than virgin fiber. Furthermore, prospects for capacity expansion in the western USA are dim. Such expansion--if it occurs at all--is likely to be limited to existing mills rather than development of new greenfield operations. Against this backdrop, CVA forecasts softwood chip export prices will follow a declining trend the forecast period (from \$86/bone-dry unit, or bdu, in Oregon and Washington in 2001), reaching \$73/bdu in 2006. RISI forecasts a slightly more optimistic outlook for softwood chip export prices, predicting a decline to a cyclical low of \$79/dry short ton in 2002, followed by a modest upswing through 2003 and 2004 to \$97/dry short ton in 2004.

These forecast prices fall well short of the price spikes reported in the mid-1990s. For DNR, the transitory nature of regional pulpwood markets highlights the uncertainty associated with relying on smallwood commercial thinning for pulpwood production to achieve silvicultural or revenue objectives.

Softwood Sawtimber Stumpage

RISI and CVA forecast stumpage trends that are similar in the near term; specifically both companies forecast rising near-term stumpages. RISI forecasts western sawtimber stumpage (and log prices) to rise through 2002 and 2003 to a cyclical peak in 2004, before declining

through 2005 and 2006. CVA anticipates DNR stumpage will rise through 2002 to a peak (of \$310/mbf) in 2003, before declining through 2004 to a cyclical low of \$268/mbf in 2005. Both RISI and CVA stumpage price projections reflect their respective forecasts of construction activity and timber supply. In effect, softwood stumpages appear to be re-establishing themselves at about late 1980 and early 1990 levels (in real terms).

Since about 1999, softwood stumpage and log prices in westside Washington and Oregon have tended to converge with softwood stumpage in the US South, and similar convergences can also be observed in the mid-1980s and the early 1970s. This price convergence is also observable as changes in relative price, and probably reflects shifts in the relative abundance of softwood stumpage and logs in the two regions. Such shifts may be attributed to numerous factors including (but not necessarily limited to) the age-class distribution of the southern resource, softwood log imports into the Pacific Northwest from Canada, depressed softwood log and lumber market conditions in Japan, and trade restrictions on softwood lumber imported into the USA from Canada. While it may be difficult analytically to identify and isolate the effects of individual contributing factors, this price convergence is felt in the Pacific Northwest region as downward pressure on stumpage and log prices (and as upward pressure in the US South).

In the longer term, there are three major structural factors at work on the demand side of the forest products economy.⁴ These factors include:

- Relatively high demand for housing, driven by the proportion of the population in the household forming years;
- Substitution away from solid wood products, in favor of EWP and non-wood products (discussed in a previous section); and
- Increased competition from other suppliers of logs, lumber, and other wood products in both domestic and export markets, and substitution away from US-sourced products.

On the supply side of the US forest products economy, the productive base in the western USA is likely to remain under pressure (from, for example, regulatory pressures), even though thinning programs on national forest lands look a likely prospect. Conversion of forestland to other land uses will also contribute to a diminishing timber supply base, as is occurring in the Pacific Northwest (for example, see Azuma *et al.*, 1999).

As noted previously (see pages 4 and 5), log imports from Canada have increased in the past three to four years, a change made possible by the dual conditions of softwood lumber trade restrictions imposed on exports of softwood lumber from Canada into the USA and adverse export market conditions for Canadian softwood lumber outside the USA. These Canadian log imports are likely depressing local log prices in western Oregon and western Washington (especially at the whitewood end of the market), and reducing returns to the timber grower accordingly. DNR is not immune to these pressures.

⁴ Further details regarding these long-term trends are available in the November 1998 forecast (Glass, 1998).

The competitive and relatively depressed state of the Japanese softwood log and lumber market is also indirectly contributing to low domestic US log prices. The direct effect is the redirection of exportable US logs to the domestic log market. However, market dynamics in Japan coupled with US and BC softwood trade policies are further exacerbating this effect indirectly. Not only is the US share of softwood log imports into Japan declining, but it also appears as though some of the decline is attributable to increased exports of Canadian softwood logs to Japan (Figure A). In effect, increasing Canadian log exports appear to be squeezing additional US log volume out of the Japanese market, presumably for redirection into the domestic log market. A similar set of dynamics is also at work on Japanese imports of US softwood lumber, where increasing imports of European lumber are squeezing US (and Canadian) lumber exports out of the Japanese market (Figure B). Both factors are indirectly contributing to downward price pressure in the domestic log market.

Trade restrictions on imports of softwood lumber from Canada into the USA have not so far increased the US domestic price of softwood lumber, even though the combined countervailing duty and penalty tariff are very large (averaging about 27%). In fact, softwood lumber imports from Canada have increased dramatically in recent months. Several factors could be contributing to this somewhat surprising turn of events. One factor may be that, in the absence of a quota-based restriction, at least some Canadian lumber producers are able to increase mill throughput and lower average production costs by virtue of increasing lumber exports. In effect, Canadian lumber producers would then be demonstrating a capacity to

**Figure A: Annual volumes of softwood logs (HS 44032..) imported into Japan
by selected countries of origin, 1995-2002**

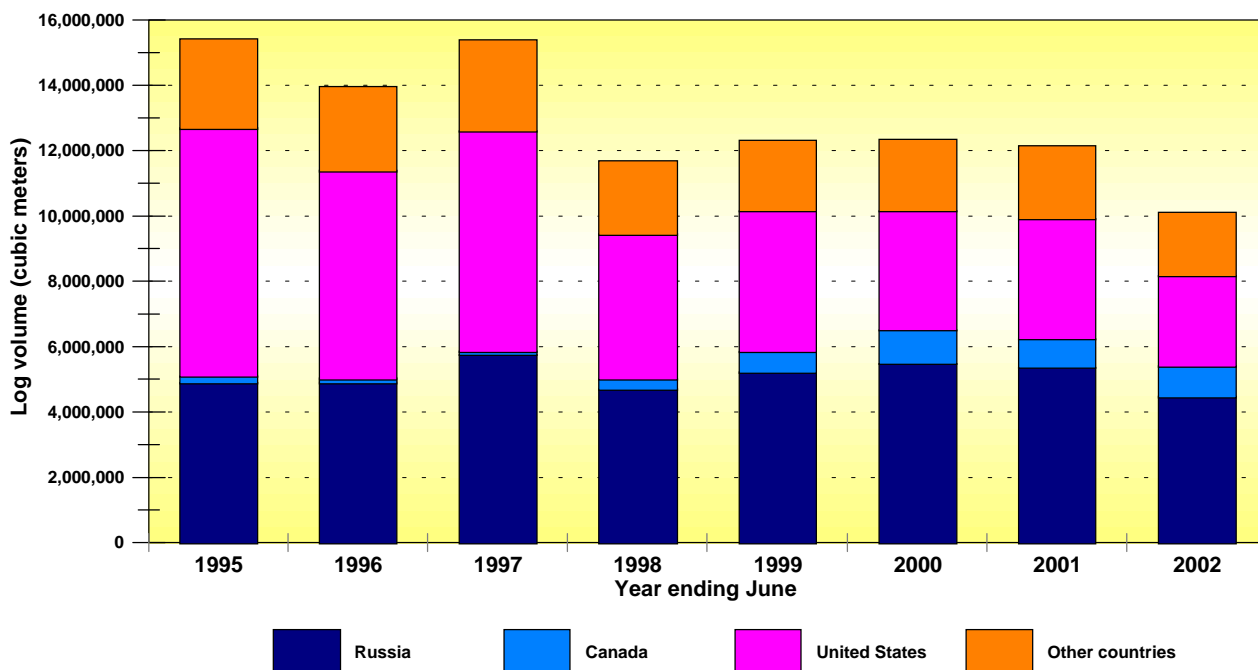
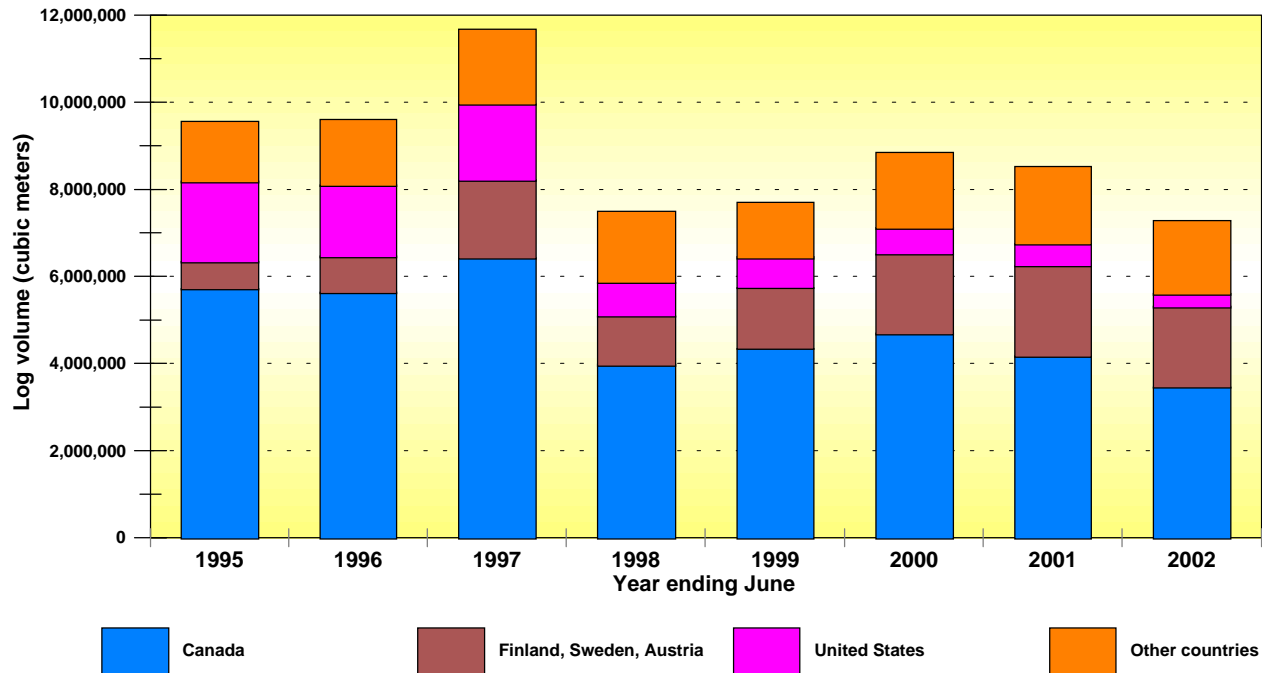


Figure B: Annual volumes of softwood lumber (HS 44071..) imported into Japan by selected countries of origin, 1995-2002



absorb the combined duty and tariff--while US lumber demand remains strong. Alternatively, relatively low softwood lumber prices could be the result of drawing down lumber inventories that were built up during the brief period after the Softwood Lumber Agreement expired, but before the current duty and tariff regime was imposed. Whatever the explanation, current and prospective lumber market conditions are likely to be exerting a downward pull on stumpage for timber sales offered by the department, at least in the near to medium term.

OVERVIEW AND KEY ASSUMPTIONS OF FORECAST

Overview

Revenues are forecast for management activities carried out by DNR on state-owned lands managed by the department for various trust beneficiaries (Table 1). Two administrative divisions of DNR are responsible for generating revenues from managing these trust lands: Product Sales and Leasing, and Aquatic Resources.

Table 1: Uplands and aquatic lands managed by the Washington State Department of Natural Resources

Uplands	Aquatic lands
Forest Board transfer lands	Beds of navigable waters
Forest Board purchase lands	First class tidelands and shorelands
Common school, indemnity and escheat grants	Second class tidelands and shorelands
Agricultural school grant (Washington State University)	Harbor areas
Scientific school grant (Washington State University)	
University grant--Original and transferred (University of Washington)	
Charitable, educational, penal, and reformatory institutions grant	
Normal school grant (Eastern, Central, and Western Washington Universities, and The Evergreen State College)	
Capitol building grant	
Community and technical college forest reserve	

Forecasting is carried out at a high level of aggregation. Overall revenue flows are allocated to the various trust beneficiaries and their associated management funds according to: (1) the trust lands from which they are derived; and (2) legislative mandates.

This forecast does not estimate revenues from all sources. For timberland, only revenues from timber sales and special forest products are estimated. Revenues from timber sales-related activities, forest road assessments, nursery seedling sales, and miscellaneous timber revenues are not forecast. Other revenues that are not forecast include income from land sales, interest income, and fees, penalties, and other miscellaneous revenue.

Key Assumptions

This section focuses on the major assumptions used in projecting total revenues from timber land management activities on trust lands. Key assumptions include projected timber sales volumes and prices, and the removal rate of timber from both uncut timber under contract and new sales. The effects of changes in these key assumptions are tested in a sensitivity analysis (see page 37).

1. Timber Sales Volume

The timber sales estimates used in the forecast (Table 2 below) are sourced from the Product Sales and Leasing Division (PSLD). Where possible, PSLD staff derive timber sales estimates from the department's action plans. The forecast assumes target (sold) timber sales levels of 560 mmbf per year for the years beyond those spanned by the action plans, i.e., FY 2004 and beyond. While these target sales levels represent the department's best interim estimate of what will actually be sold (considering recent timber sales levels, and various harvest and operational restrictions), they are subject to considerable uncertainty in practice. The estimates are compiled under certain assumptions (listed below) that may prove too optimistic or pessimistic in reality. In particular, since recalculation of the sustainable harvest is not yet complete, sales levels for FY 2004 and beyond should be regarded as provisional, and subject to potentially substantial revision. Results of the recalculation will be incorporated in the forecast in due course.

The main assumptions underlying the estimates presented in Table 2 are:

- Meeting offered sales levels is operationally feasible.
- Sufficient resources are available to achieve the offered sales levels.
- Offered sales levels are not constrained by legal challenges, new regulations, or non-timber management objectives.

Table 2: Annual sold timber sales volumes--Comparison of September 2002 forecast with June 2002 forecast, 2000-2007

Fiscal year ending June	June 2002 forecast (mmbf)	September 2002 forecast (mmbf)	Change (mmbf)	Change (%)
2000	503 ¹	503 ¹	0	0.0
2001	460 ¹	462 ³	2	0.4
2002	502 ²	493 ⁴	-9	-1.8
2003	542 ²	550 ²	8	1.5
2004	558 ^{2,5}	560 ^{2,5}	2	0.4
2005	557 ^{2,5}	560 ^{2,5}	3	0.5
2006	557 ^{2,5}	560 ^{2,5}	3	0.5
2007	557 ^{2,5}	560 ^{2,5}	3	0.5

Notes:

1. Actual volumes.
2. Predicted volumes.
3. Updated volume.
4. Preliminary volume.
5. Estimates for FY 2004 & beyond are provisional, pending recalculation of the sustainable harvest.

Compared with the June 2002 forecast, actual (preliminary) sold timber sales volumes were 9 mmbf lower than anticipated for FY 2002 (Table 2). However, target sold timber sale volumes for FY 2003 at 550 mmbf are 8 mmbf higher compared with the June 2002 forecast, resulting in a net biennial reduction of 1 mmbf. This September 2002 forecast assumes (virtually) no change in sold timber sales levels for FY 2004 through FY 2007.

2. Timber Sales Prices

For the most part, DNR sells sawtimber for lumber and plywood production, i.e., standing timber for harvest during a specified time frame. The principal sawtimber species are the softwoods Douglas-fir (*Pseudotsuga menziesii*) and western hemlock (*Tsuga heterophylla*).

'Stumpage' refers to the price of standing timber, and DNR stumpage is generally higher than the US Forest Service Westside All Species softwood sawtimber bid stumpage (Figure 1). This price differential reflects quality differences and, to perhaps a lesser extent, factors such as differences in location, access, topography, and contract terms.

DNR sales are assumed to comprise a mix of sales and product types similar to that produced in past years. Substantial price differentials exist between product types offered for sale by the department. Likewise, price differentials occur from species to species within specific product types. The sales price forecasts take such qualitative differentials into account only to the degree that these differences are reflected in the product mix sold by the department prior to June 30, 2002.

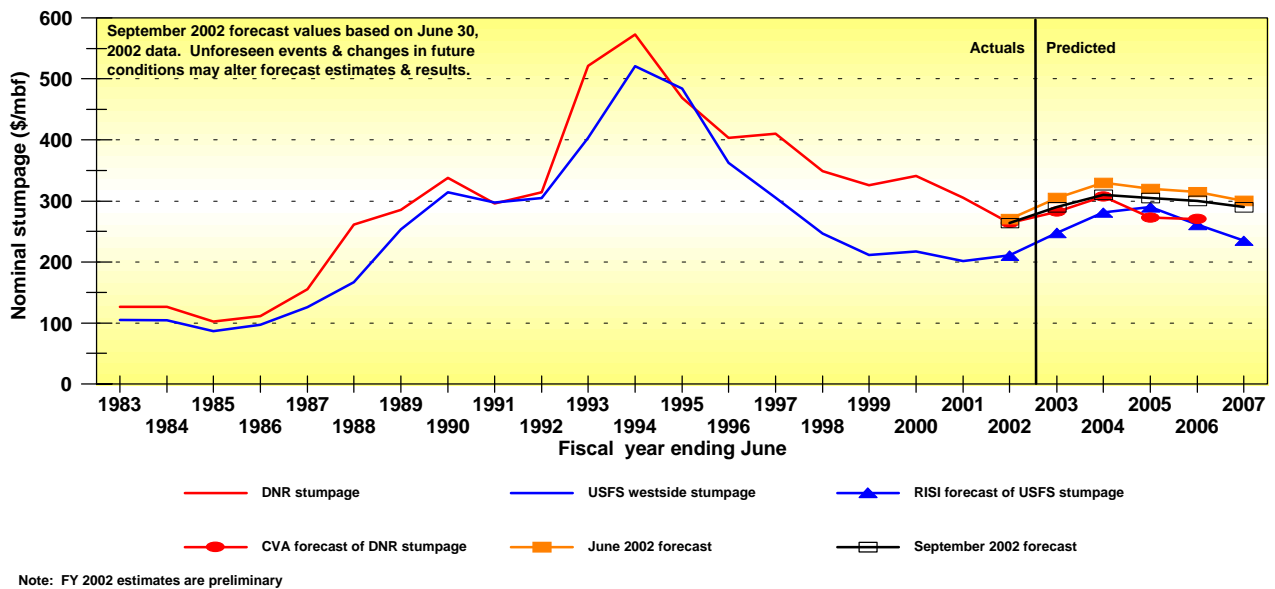
Table 3: Annual timber sales prices--Comparison of September 2002 forecast with June 2002 forecast, 2000-2007

Fiscal year ending June	June 2002 forecast (\$/m bf)	September 2002 forecast (\$/m bf)	Change (\$/m bf)	Change (%)
2000	341 ¹	341 ¹	0	0.0
2001	305 ¹	306 ¹	1	0.1
2002	270 ²	264 ³	-6	-2.2
2003	305 ²	290 ²	-15	-4.9
2004	330 ²	310 ²	-20	-6.1
2005	320 ²	305 ²	-15	-4.7
2006	315 ²	300 ²	-15	-4.8
2007	300 ²	290 ²	-10	-3.3

Notes:

1. Actual values.
2. Predicted values.
3. Preliminary value.

Figure 1: Actual and predicted nominal stumpages for Washington state DNR and US Forest Service timber sales of all species west of the Cascade Mountains, 1983-2007



From a low of \$264/mbf in FY 2002 (provisional estimate), DNR stumpage is forecast to rise through FY 2003 to a cyclical high of about \$310/mbf in FY 2004 (Figure 1), in part reflecting prospective impacts of FRB interest rate cuts made in CY 2001 on the US economy in general (and residential construction in particular). For this September 2002 forecast, estimates of sales prices for FY 2003 through FY 2007 have been reduced by between \$10/mbf and \$20/mbf (Table 3), in line with changes in RISI and CVA forecast estimates. These estimates include anticipated effects of duties on imports of softwood lumber from Canada, depressed softwood lumber market conditions in Japan, and exchange rate movement. Collectively these factors will probably tend to sustain softwood log exports from Canada into the western USA at historically high levels, thereby limiting potential for stumpage increases in the sawtimber market. Recent increases in fees payable by purchasers of DNR-offered timber sales also tend to reduce stumpage estimates.

3. Timber Removals From New Sales

Total timber removal volumes consist of two portions: removals from uncut timber currently under contract, and removals from new sales, i.e., planned timber sales that have not yet been sold. A purchaser survey is used to estimate intended removals from uncut timber under contract (survey results are reported on page 21).

A different approach is used to estimate removals from sales that have not yet been sold. In the near term (i.e., two to three years out), total timber removal volumes are estimated using statistical methods that take into account factors such as sales volumes, housing starts, prices of substitute products, etc. Removals from new (future) sales are then calculated by deducting

harvesters' collective removal intentions, obtained from the purchaser survey mentioned above. Beyond this two to three year time horizon, a profile of timber removals from new sales over time is used to project removals from new, as yet unsold, timber sales only. The profile is based on the distribution of sales contract lengths over the preceding 24 months, and assumes:

- The distribution of the lengths of new sales over the forecast period will be the same as the distribution of sales lengths over the last 24 months.
- Purchasers will harvest sales during the last year of sale contracts.⁵

Taken together, these assumptions effectively mean the data presented in Table 4 (i.e., the distribution by value of timber sales by sale length in years) may be interpreted as the average proportions of individual sale volume removed in consecutive years of the sale. Actual revenues are received upon removal of timber, rather than at the time of the sale.

Table 4: Per cent distributions, by value, of timber removals from new sales:
Comparison of current forecast with previous forecast

Year of sale	First	Second	Third	Fourth	Fifth
Current forecast	9%	36%	42%	12%	1%
Previous forecast	11%	33%	45%	11%	1%

Note: Totals may not add to 100% due to rounding.

⁵ The validity of this assumption depends upon the length of the sale contract, since the probability of removals occurring prior to the last year of a sale tends to increase with increases in sale contract duration (all other things being equal).

REVENUE FLOWS BY SOURCE

Overview

Timber sales are the major source of revenue from DNR-managed lands (Table 5, Figure 2). For forecasting purposes, all of these revenues are assumed received upon removal of the timber. Non-timber revenues have been accounting for an increasing share of total revenues, from about 9% in FY 1997 to some 20% in FY 2002. This trend is forecast to continue through the entire forecast period, with non-timber revenues achieving about a 23% share of total revenues by FY 2007 (i.e., excluding trust land transfer revenues). Consistent with past years, revenues from non-timber upland management activities are projected to remain higher than those from aquatic land management activities.

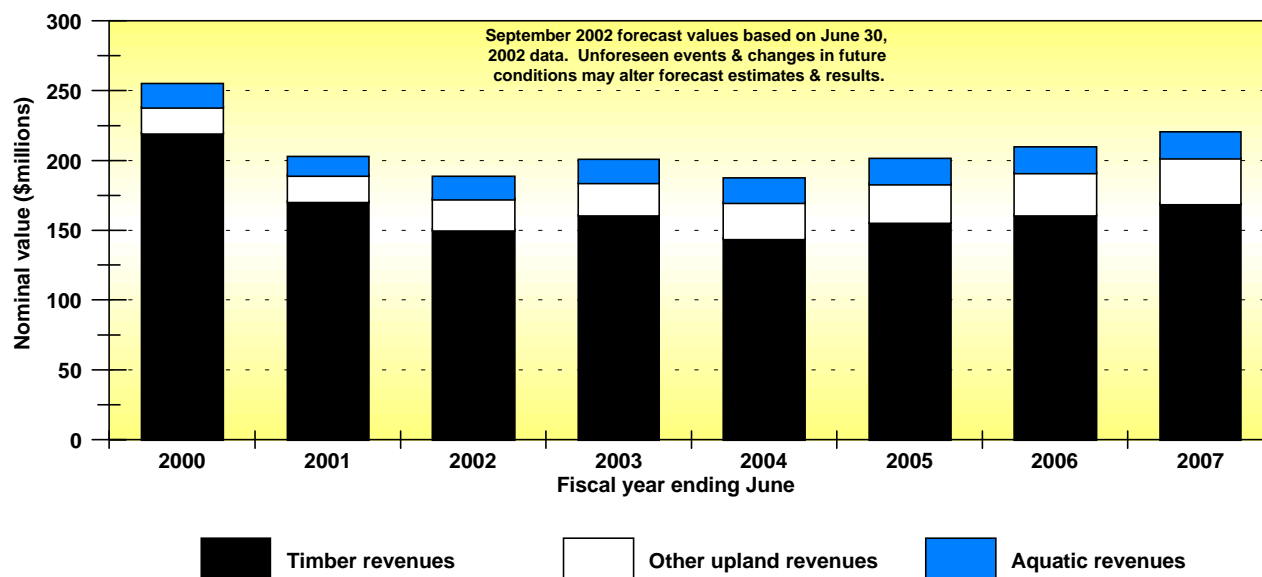
Table 5: Annual revenue flows (cash basis) by source, 2000-2007¹

Fiscal year ending June	Timber removal revenue (\$millions)	Other upland revenue (\$millions)		Aquatic revenue (\$millions)	Total revenue (\$millions) ²	Trust land transfers (\$millions) ²
		Agriculture & mineral	Commercial real estate			
2000 ³	219.9	12.4	6.1	16.9	255.3	24.7
2001 ³	170.6	13.5	5.7	13.0	202.8	31.9
2002 ⁴	150.9	14.4	7.5	15.7	188.4	8.6
2003 ⁵	161.1	14.8	8.0	16.7	200.6	31.4
2004 ⁵	144.8	15.8	9.5	17.4	187.4	0.0
2005 ⁵	155.3	17.1	11.0	18.0	201.5	0.0
2006 ⁵	160.9	17.8	12.5	18.6	209.8	0.0
2007 ⁵	169.3	18.6	14.0	18.8	220.7	0.0

Notes:

1. Excludes revenues from interest, trespass, land sales, timber sales-related activities, forest road assessments, nursery seedling sales, etc.
2. Totals may not add due to rounding, and exclusion of non-trust activities carried out by DNR over and above its trust land management mandate. Totals also exclude trust land transfer payments, specifically payments of approximately \$56.06 million in FY 00-01, and \$40 million (estimate) in FY 02-03, payable to the Common School Construction fund. Refer to page 31 for further details.
3. FY 2000 through FY 2001 data are actual values.
4. Data for FY 2002 are preliminary values.
5. Data for FY 2003 and subsequent years are predicted values.

Figure 2: Nominal revenue flows by source, 2000-2007



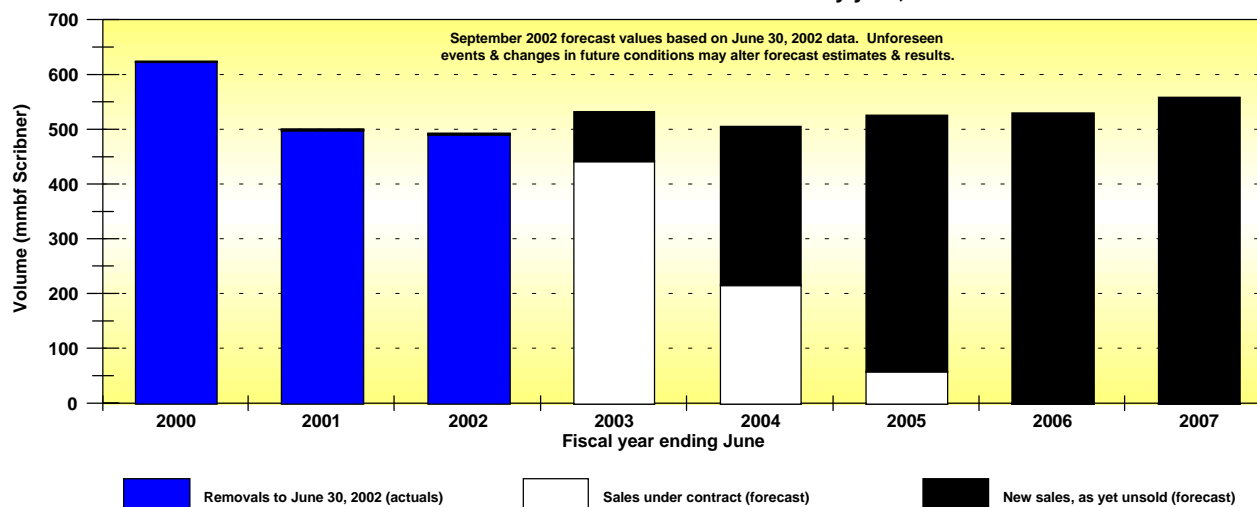
Notes: Excludes revenues from Trust Land Transfer activities; FY 2002 estimates are preliminary; Estimates for FY 2003 and beyond are forecasts

1. Timber Land Management

a. Timber Removal Volumes

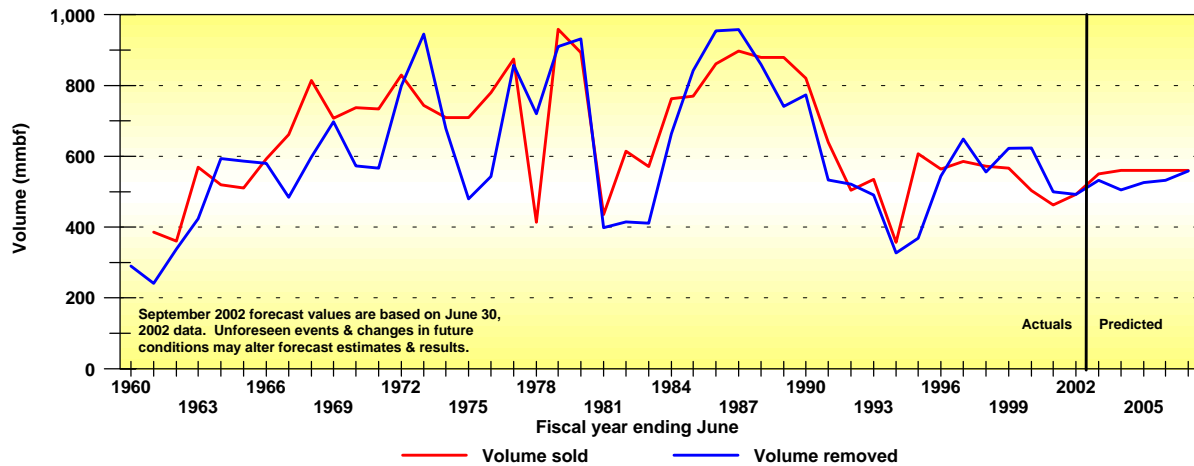
The pattern of removals anticipated from uncut sales under contract and new sales is illustrated in Figure 3. Timber removal volumes declined from 500 mmbf in FY 2001 to 492 mmbf in FY 2002 (Figure 4), and total removals over the entire FY 2002-2007 forecast period are estimated to be about 37 mmbf lower for the September 2002 forecast compared with the June 2002 forecast (3,182 bbf *versus* 3,145 bbf; Table 6), in part because of the current economic slowdown is lasting longer than anticipated, and in part because of reduced estimates of future residential construction activity.

Figure 3: Actual and forecast distribution of timber removal volumes from uncut sales under contract and new sales by year, 2000-2007



Notes: Removal volumes from new sales are based on the following proportions: 9% in year 1, 36% in year 2, 42% in year 3, 12% in year 4, and 1% in year 5; FY 2002 estimates are preliminary

Figure 4: Comparison of sold timber sales volumes with timber removals volumes, 1960-2007



Note: FY 2002 estimates are preliminary

Table 6: Annual removal volumes--Comparison of September 2002 forecast with June 2002 forecast volumes, 2000-2007

Fiscal year ending June	June 2002 forecast (mmbf)	September 2002 forecast (mmbf)	Change (mmbf) ¹	Change (%)
2000	624 ²	624 ²	0	0.0
2001	500 ²	500 ²	0	0.0
2002	502 ³	492 ⁴	-10	-2.0
2003	532 ³	532 ³	0	0.0
2004	505 ³	505 ³	0	0.0
2005	526 ³	526 ³	0	0.0
2006	560 ³	532 ³	-28	-5.1
2007	556 ³	558 ³	2	0.4
2002-07 ¹	3,182	3,145	-37	-1.2

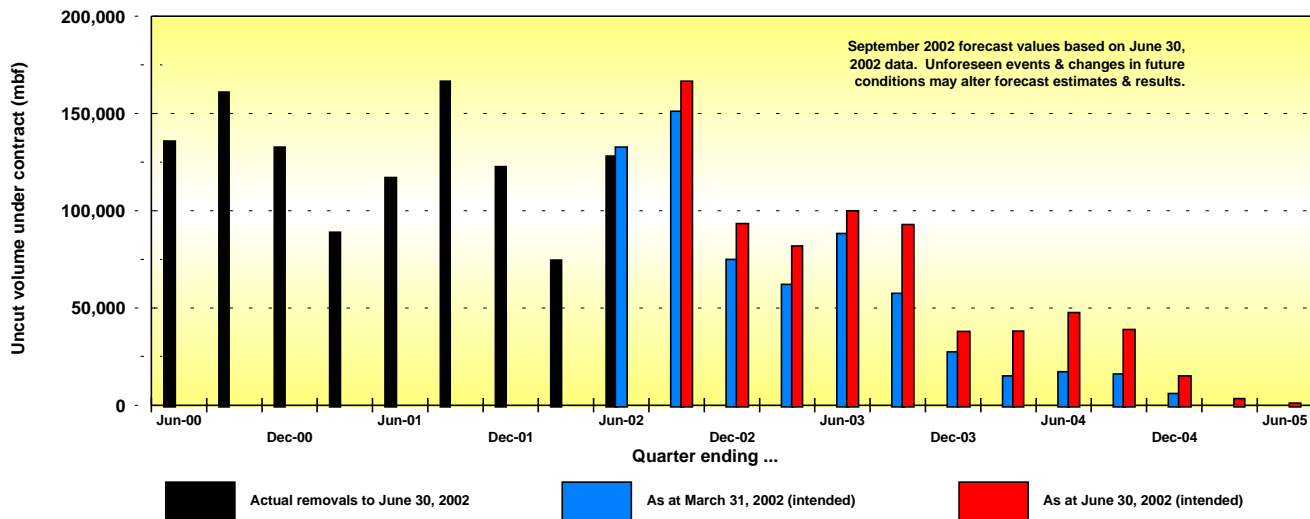
Notes:

1. Totals may not add due to rounding.
2. Actual volumes.
3. Predicted volumes.
4. Preliminary volume.

Removals in FY 03 are estimated to increase from 492 mmbf in FY 2002 to 532 mmbf in FY 2003 (Table 6). Removal volumes are then forecast to decrease to 505 mmbf in FY 2004, before increasing through FY 2005 and FY 2006 to reach some 558 mmbf in FY 2007. This profile of removal volumes mainly reflects end-use factors likely to govern wood consumption over the forecast period (see 'Market Outlooks' section). Also, note that the reduced estimate of removals for FY 2006 is largely an artifact of the underlying forecast methods. In particular, it reflects the transition from using a statistical model in deriving estimates of removals up to FY 2005, to use of a removal rate assumption from FY 2006 onward (see pages 17 and 18 for further details).

Actual removals for the June quarter (April, May, and June, 2002) were approximately the same as the intentions expressed in the purchaser survey carried out for the June 2002 forecast (Figure 5). This pattern is consistent with market conditions over that time.

Figure 5: Purchasers' intended removals of timber from uncut timber under contract by quarter and purchaser survey date, June 2000 to June 2005



From time-to-time, some survey respondents express legitimate reservations regarding the reliability of the removal data they provide. These respondents base their comments on their practical experience with how rapidly market conditions--and their responses to those conditions--can change. However, examination of responses to the survey of purchasers' harvest intentions (both at the individual company level and in aggregate) has indicated survey responses are generally consistent with prevailing market conditions. The purchaser survey thus remains the best tool presently available for estimating near-term timber removals and, in fact, has provided quite reliable estimates of removal volumes for the ensuing 12 months.

b. Current Quarter Activity

During the June quarter of FY 2002, DNR offered 81 'Board'⁶ timber sales for purchase (total volume of some 214 mmbf), of which 74 sold for a volume of 198 mmbf, compared with 146 mmbf sold of 167 mmbf offered in the previous quarter. Sixty-eight of the sold sales (187 mmbf) had not been offered for sale previously, compared with 40 first-time sales in the March quarter (for a volume of 125 mmbf).

⁶ 'Board' sales refer to sales having an appraised value of \$100,000 or more, and offering these sales requires approval of the Board of Natural Resources (hence the colloquial name). Board sales generally comprise in excess of some 95% by volume and/or value of all sales sold by the department.

The total value of all timber sales sold in the June quarter was some \$50 million, for an average stumpage of \$251/mbf. This average stumpage represents a \$21/mbf decrease over the March quarter, an 8% decline reflecting the quality of product mix offered by the department during this time, increases in sales fees, and diminished demand.

As shown in Table 7, about 653 mmbf of uncut timber was under contract at the end of the third (March) quarter of FY 2002, worth some \$193 million. During the fourth (June) quarter of FY 2002, the volume and value of uncut timber under contract increased by approximately 66 mmbf and \$10 million respectively (i.e., after taking defaults, etc. into account).

As might be expected given the decline in stumpage experienced over the June quarter, average stumpages for uncut timber under contract also declined over the June quarter, from \$295/mbf to \$283/mbf (Table 7). This stumpage change reflects the net effect of both new sales sold over the quarter and removals from uncut sales over the same quarter.

Table 7: Current quarter activity--Uncut timber under contract by sale expiration date, June quarter, fiscal year 2002¹

Sale expiration date (year ending June)	Expiring volume (mmbf)	Expiring value (\$millions)	Average price (\$/mbf)
A: At end of previous quarter (March 31, 2002)			
2002	19	5.4	280
2003	195	62.6	321
2004	246	77.5	315
2005	177	45.4	256
2006	15	2.1	139
TOTAL ²	653	193.0	295
B: At end of current quarter (June 30, 2002)			
2002	0	0.0	n.a.
2003	146	45.9	314
2004	305	91.9	301
2005	249	63.0	253
2006	19	2.5	132
TOTAL ²	719	203.2	283

Key: n.a. = not applicable

Notes:

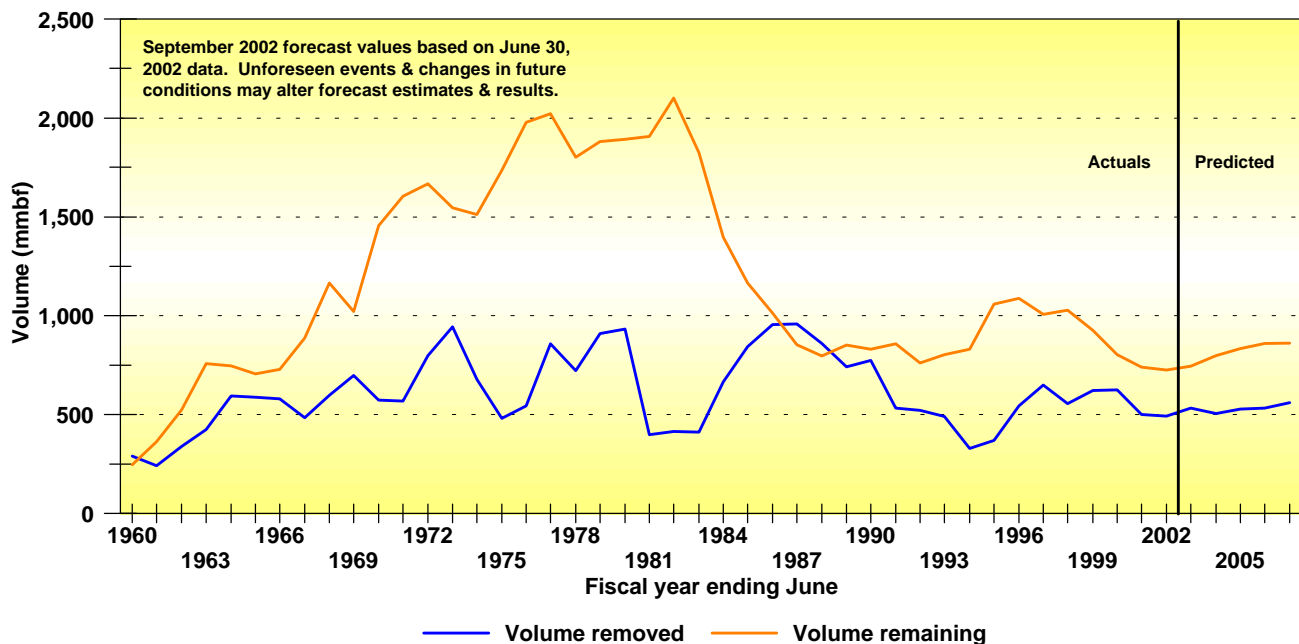
1. Data are subject to revision with updating of DNR's information systems.
2. Totals may not add due to rounding.

Compared with the previous March quarter, removals from uncut timber under contract were substantially higher (128 mmbf *versus* 75 mmbf). However, this removal level is still low compared with prior June quarters, reflecting the general economy-wide slowing of economic activity, and relative abundance of supply.

c. Timber Inventory Levels

The amount of uncut timber under contract, while forecast to increase, will remain low by historical levels. From about 725 mmbf at the end of FY 2002, inventory levels (i.e., remaining uncut volume under contract) are projected to rise through FY 2003-2005 to a plateau of about 860 bbf in FY 2006 and FY 2007 (Figure 6). At forecast removal rates, this inventory accumulation represents an decrease from about 1.5 years' worth at the start of FY 2003 to about 1.4 years' worth at the end of FY 2003, and then an increase to a peak of 1.6 years' worth in FY 2006. Interpretation of the predictions of uncut timber under contract requires care however, because the estimates depend on achieving the target levels of new sales, and on removals from both uncut timber under contract and new sales. For this September 2002 forecast, the rising uncut inventory under contract reflects estimates of increasing sales volumes in the face of fairly flat near-term removals.

Figure 6: Comparison of volume of timber removed with standing timber remaining under contract, 1960-2007



Note: FY 2002 estimates are preliminary

d. Timber Removal Prices

Timber removal prices are prices at the time of harvest. A timber removal price is, in effect, a weighted average of sales prices. It is derived as the total value of timber removed from timber sales during a given period, divided by total volume of timber removed from those sales during that same period.

Removal prices are forecast to remain remarkably flat during the entire forecast period (FY 2002 through FY 2007). After a very gradual decline from \$307/mbf in FY 2002 to a low of \$287/mbf in FY 2004, removal prices are forecast to increase in a similarly slow fashion to a peak of \$303/mbf in FY 2006 and 2007 (Table 8, Figure 7). This trend is a direct, lagged result of the past and anticipated future trend in timber sales prices. Compared with the June 2002 forecast, on average removal prices for the September 2002 forecast are about 4% lower over the forecast period.

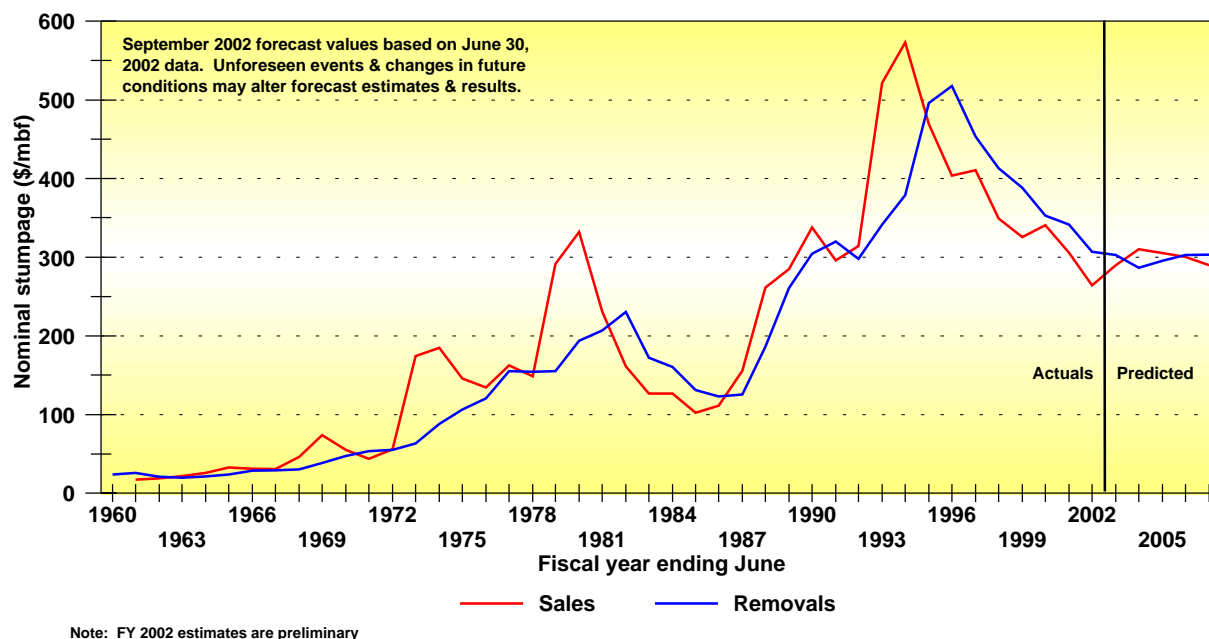
Table 8: Annual timber removal prices--Comparison of September 2002 forecast with June 2002 forecast values, 2000-2007

Fiscal year ending June	June 2002 forecast (\$/mbf)	September 2002 forecast (\$/mbf)	Change (\$/mbf) ¹	Change (%)
2000	353 ²	353 ²	0	0.0
2001	341 ²	341 ²	0	0.0
2002	310 ³	307 ⁴	-3	-1.0
2003	312 ³	303 ³	-9	-3.0
2004	313 ³	287 ³	-26	-8.4
2005	301 ³	295 ³	-6	-2.0
2006	314 ³	303 ³	-11	-3.5
2007	319 ³	303 ³	-16	-5.0

Notes:

1. Totals may not add due to rounding.
2. Actual values.
3. Predicted values.
4. Preliminary value.

Figure 7: Comparison of nominal prices for timber sales with nominal prices for timber removals, 1960 - 2007



e. Timber Removal Revenues

Removal revenues are forecast to increase by about 7% through FY 2003 from an FY 2002 level of \$150.9 million, in association with increasing removal volumes and virtually static removal prices (Table 9). Removal revenues are then expected to decrease to about \$145 million in FY 2004, and then to increase in the latter years of the forecast period to a peak of about \$169 million in FY 2007, as the effects of rising removal volumes in particular (and in turn driven by increasing estimates of target timber sales volumes) feed into removal revenues. Over the FY 2002-2007 period, total removal revenues are some \$49 million less than estimated in the June 2002 forecast. Note, though, that these estimates of removal revenues are also based on estimates of future sales volumes that may not be realized (see page 15).

2. Management of Upland Non-Timber Resources

Besides timber revenues, the major upland revenue sources are agricultural activities and commercial real estate leases. Other upland revenue sources include mining, communication site leases, special use leases, right-of-way and easement grants, and non-timber (termed 'special') forest products.

For FY 2002, revenues from DNR's property management activities totaled about \$14 million, while revenues from agricultural activities earned nearly \$8 million (Figure 8). In total, non-timber upland revenues are forecast to increase by nearly \$11 million from about \$22 million in FY 2002 to nearly \$33 million by the end of FY 2007 (Table 10).

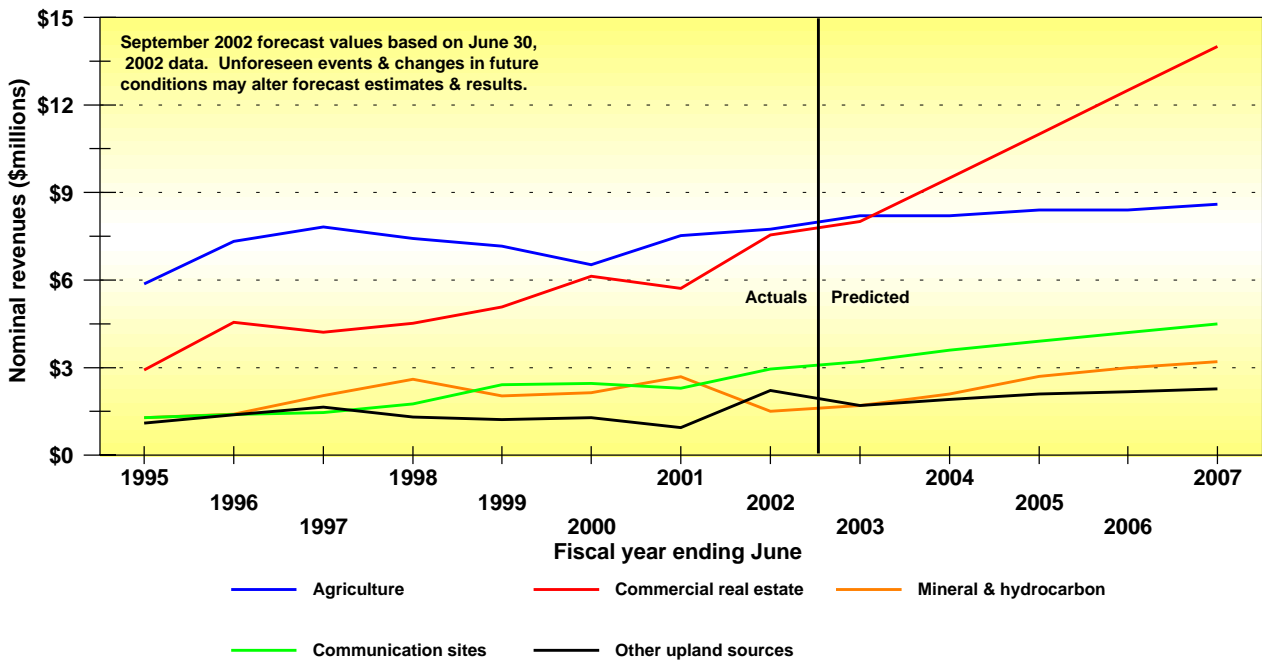
Table 9: Annual timber removal revenues--Comparison of September 2002 forecast with June 2002 forecast values, 2000-2007

Fiscal year ending June	June 2002 forecast (\$millions)	September 2002 forecast (\$millions)	Change (\$millions) ¹	Change (%)
2000	219.9 ²	219.9 ²	0.0	0.0
2001	170.6 ²	170.6 ²	0.0	0.0
2002	155.7 ³	150.9 ⁴	-4.7	-3.0
2003	166.1 ³	161.1 ³	-5.0	-3.0
2004	158.1 ³	144.8 ³	-13.3	-8.4
2005	158.5 ³	155.3 ³	-3.2	-2.0
2006	175.7 ³	160.9 ³	-14.7	-8.4
2007	177.5 ³	169.3 ³	-8.2	-4.6
2002-07 ¹	991.6	942.4	-49.2	-5.0

Notes:

1. Totals may not add due to rounding.
2. Actual values.
3. Predicted values.
4. Preliminary value.

Figure 8: Actual and predicted annual non-timber revenues by source, 1995-2007



Note: FY 2002 data are preliminary

Table 10: Annual non-timber upland revenues--Comparison of September 2002 forecast with June 2002 forecast values, 2000-2007

Fiscal year ending June	June 2002 forecast (\$millions)	September 2002 forecast (\$millions)	Change (\$millions) ¹	Change (%)
2000	18.6 ²	18.6 ²	0.0	0.0
2001	19.2 ²	19.2 ²	0.0	0.0
2002	20.1 ³	21.9 ⁴	1.8	9.3
2003	20.9 ³	22.8 ³	1.9	9.1
2004	22.1 ³	25.3 ³	3.2	14.3
2005	23.4 ³	28.1 ³	4.7	19.9
2006	24.5 ³	30.3 ³	5.8	23.7
2007	25.3 ³	32.6 ³	7.3	28.6
2002-07 ¹	136.3	161.0	24.7	18.1

Notes:

1. Totals may not add due to rounding.
2. Actual values.
3. Predicted values.
4. Preliminary value.

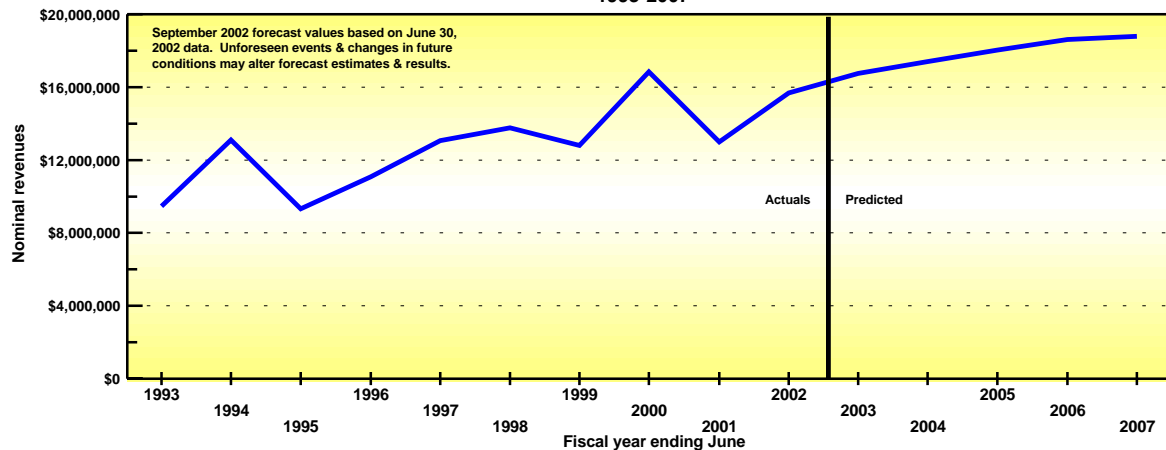
For this September 2002 forecast non-timber upland revenues are substantially higher than the June 2002 forecast, by nearly \$25 million (18%) over the FY 2002-2007 forecast period (Table 10). This revenue increase in part reflects increased revenues obtained from new, long-term leases let in FY 2002, exceeding previous revenue projections by 9%. The most valuable of these leases are for irrigated agriculture (including vineyards) and commercial properties. In part, the revenue increase also reflects anticipated changes in departmental business practices aiding the repositioning of existing nontimber income-producing assets into more productive situations, by means of property exchanges, sales, and purchases.

The possibility of increased wheat revenues was noted in the September 2001 forecast (Glass, 2001). Wheat prices have increased since then (over \$4/bushel at present) and are expected to increase more over the next year. While not obvious at the time of the September 2001 forecast, it is now apparent that the effects of these increases on wheat revenues are unlikely to be offset by regional harvest reductions. Reduced harvests elsewhere in the USA (drought in the mid-west) and the world (drought and other unfavorable growing weather in Canada and Australia, flooding in Europe) on top of reduced inventory carryover, are the principal factors contributing to this price increase.

3. Aquatic Land Management

Aquatic revenues for FY 2002 totaled \$15.7 million, a \$2.7 million increase from FY 2001. Revenues from management of state-owned aquatic lands are forecast to increase through the entire forecast period from the FY 2002 level to reach nearly \$19 million in FY 2007 (Table 11). These revenue estimates are up slightly compared with June 2002 forecast estimates (by about 1% over the FY 2002-2007 forecast period), mainly because of updating the underlying

Figure 9: Actual and forecast estimates of annual aquatic revenues, 1993-2007



Note: FY 2002 estimates are preliminary

Table 11: Annual aquatic revenues--Comparison of September 2002 forecast with June 2002 forecast values, 2000-2007

Fiscal year ending June	June 2002 (\$millions)	September 2002 (\$millions)	Change (\$millions) ¹	Change (%)
2000	16.9 ²	16.9 ²	0.0	0.0
2001	13.0 ²	13.0 ²	0.0	0.0
2002	16.0 ³	15.7 ⁴	-0.3	-1.8
2003	16.6 ³	16.5 ³	0.2	1.1
2004	17.2 ³	17.4 ³	0.2	1.3
2005	17.8 ³	18.0 ³	0.3	1.4
2006	18.3 ³	18.6 ³	0.3	1.6
2007	18.5 ³	18.8 ³	0.3	1.7
2000-07	104.4	105.2	1.0	0.9

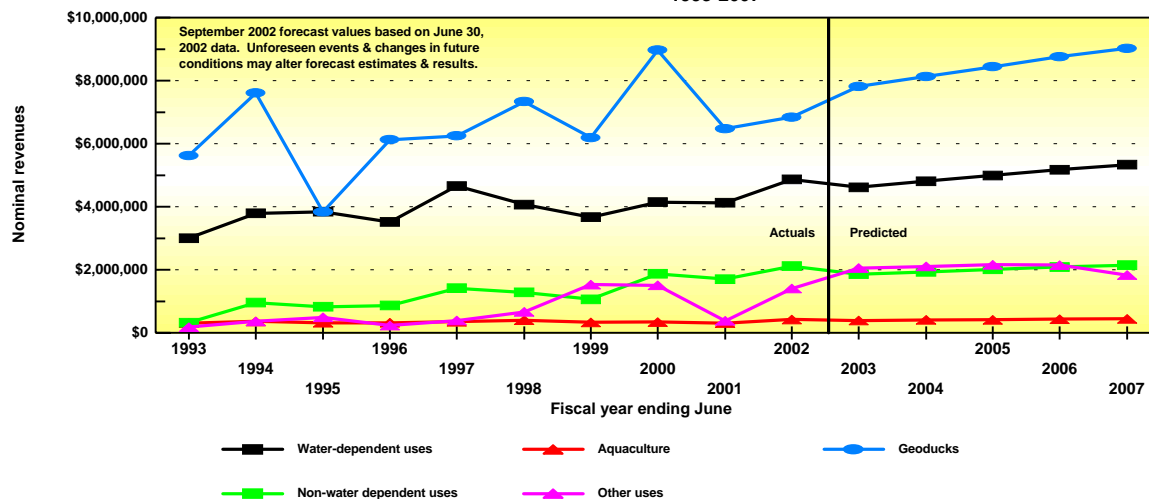
Notes:

1. Totals may not add due to rounding.
2. Actual values.
3. Predicted values.
4. Preliminary value.

data set used for estimating future aquatic revenues. Note that these aquatic revenue forecasts require cautious interpretation in view of the trend-extrapolation technique used to derive them, since this forecasting method does not incorporate underlying demand and supply drivers.

The principal aquatic revenue sources are geoduck sales and water-dependent⁷ leases (Figure 10). The decline in revenue from 'Other sources' that occurs in FY 2007 reflects the end of payments for rights-of-way for fiber-optic cables on state-owned aquatic lands.

Figure 10: Actual and forecast estimates of annual aquatic revenues by major source, 1993-2007



There remain several sources of downside risk that could potentially affect estimated geoduck revenues, although the prospect of additional geoduck supply sourced from Bush-Callow lands (i.e., tidelands granted by the state to private entities specifically for oyster cultivation) has diminished somewhat in the wake of a recent legislative change. Remaining sources of risk include:

- Obtaining a shoreline permit allowing geoduck harvest in Kitsap County: DNR has recently completed a needed environmental impact statement regarding geoduck harvest, but it is still unclear when the overall permitting process will be completed, and what the outcome will be in terms of allowable harvest activity.
- The supply of geoduck from aquaculture as opposed to wild stocks is now expected to increase market supply sooner than previously expected, and early indications are that the quality of the cultured product is very high. The potential price impact such cultured geoduck might (or might not) have on geoduck harvested from state-owned aquatic lands is not known at this time.
- Paralytic shellfish poisoning (PSP) also has the potential to adversely affect geoduck revenues. However, offsetting this risk to some extent is the ability of the department to offer a degree of supply continuity to purchasers, by spreading harvest areas

⁷ The distinction between water-dependent and non-water dependent is a legal one. Activities are legally defined as water-dependent if they cannot logically exist in any location except on the water.

geographically, thereby minimizing the likelihood of a complete harvest shut-down due to PSP.

Revenue impacts associated with these factors have not been included in the forecasts of aquatic revenues.

4. Trust Land Transfer Revenues

Trust land transfer revenues are funds appropriated by the legislature, and represent the estimated value of the foregone revenues, primarily from timber harvest, resulting from trust land transfer activities (i.e., land values are excluded). These revenues are not estimated in the revenue forecast, but are mentioned here because they do represent trust revenues obtained from land managed by the department. For further details regarding trust land transfers, refer to the November 1997 forecast (Glass, 1997).

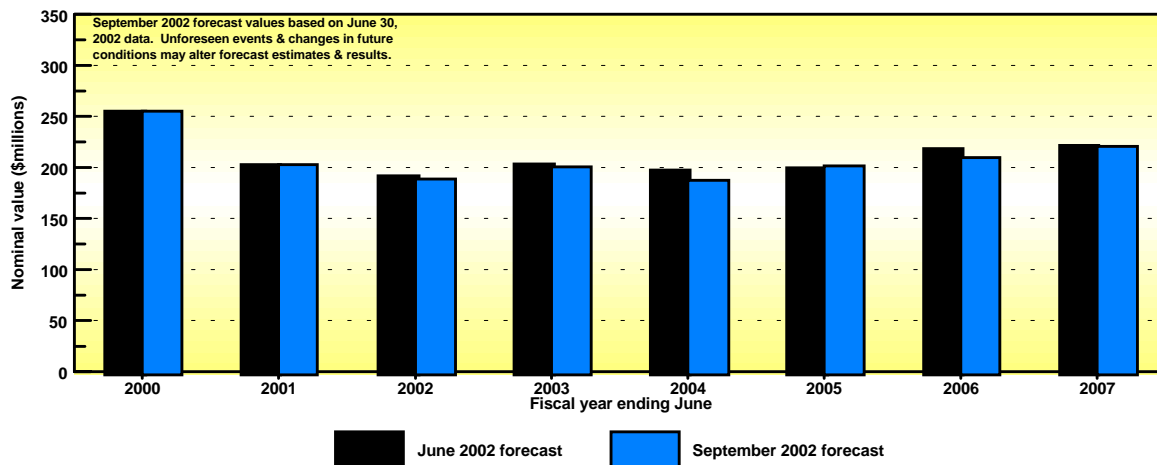
Revenues from trust land transfers payable to the Common School Construction fund amounted to \$24.7 million in FY 2000 and \$31.4 million in FY 2001 (Table 5). Trust land transfer revenue of \$8.6 million (preliminary estimate) was received in FY 2002, and a further \$31 million is anticipated in FY 2003.

REVENUE DISBURSEMENT

Overview

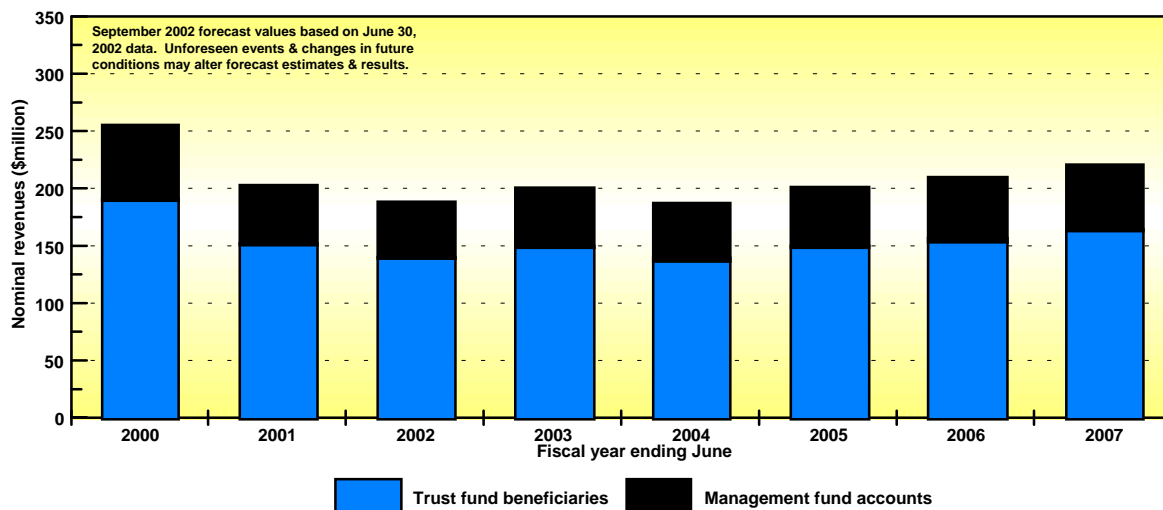
Total revenues (excluding trust land transfer payments) are forecast to follow a trend similar to timber removal revenues. As illustrated in Figure 11, compared with the June 2002 forecast, total revenues are forecast to increase from \$188 million in FY 2002 to \$201 million in FY 2003, before declining again in FY 2004 to \$187 million. Revenues are then forecast to increase through FY 2005 and FY 2006 to reach \$221 million in FY 2007. Over the entire FY 2002-2007 forecast period, revenues estimated in the September 2002 forecast are about \$24 million (2%) less compared with the June 2002 forecast.

Figure 11: Total nominal revenues from upland and aquatic land management activities--Comparison of September 2002 forecast with June 2002 forecast, 2000-2007



Note: Excludes Trust Land Transfer activities; FY 2002 estimates are preliminary; Estimates for FY 2003 and beyond are forecasts

Figure 12: Distribution of nominal revenue flows, 2000-2007



Note: Excludes Trust Land Transfer activities; FY 2002 estimates are preliminary; Estimates for FY 2003 and beyond are forecasts

The distribution over time of these revenues between trust beneficiaries and the various management accounts appears in Figure 12. In relative terms, the revenue proportions disbursed to beneficiary and management accounts change little as total revenues rise and fall, although the absolute dollar amounts change substantially.

1. Revenue Flows to Management Funds

The management funds consist of three parts: the Upland Resource Management Cost Account (RMCA), the Aquatic RMCA, and the Forest Development Account (FDA). In general, revenue flows to the management accounts are deducted at a rate of 22% of revenues earned from managing Forest Board Transfer lands and 50% of revenues earned from Forest Board Purchase lands. Revenues from these Forest Board lands are deposited in the FDA. Apart from Agricultural College Trust lands, revenues earned from (upland) federal grant lands, management fee deductions are made at a rate of 25% of total revenues; these revenues are deposited in the Upland RMCA. No management fee is deducted from revenues derived from Agricultural College Trust lands. Management deductions from revenues the department earns managing state-owned aquatic lands are deposited in the Aquatic RMCA, with the deductions being made at rates of 20% to 50%, depending upon the type of aquatic land (i.e., bedlands, first class tidelands and shorelands, second class tidelands and shorelands, and harbor areas).

In line with anticipated market conditions, revenue flows to the management funds are forecast to increase from \$48 million in FY 2002 to \$51 million in FY 2003, before declining again to \$48 million in FY 2004 (Table 12 overleaf). However, from FY 2005 to FY 2007 revenues are forecast to increase from \$51 million to \$56 million. Compared with the June 2002 forecast, management revenues for the entire FY 2002-2007 forecast period are estimated to be about \$5 million (2%) lower, reflecting reduced estimates of timber sales prices more than offsetting increased estimates of non-timber revenues). Further details of these revenue flows are presented in Figure 13 and Table 13.

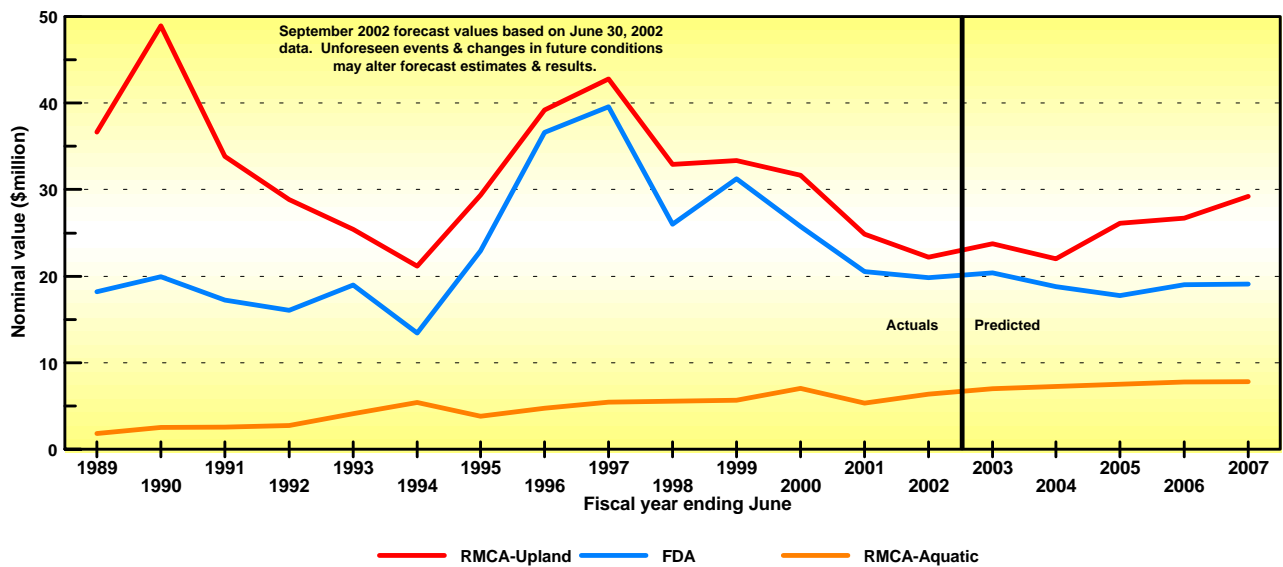
Table 12: Annual total management account revenues--Comparison of September 2002 forecast with June 2002 forecast values, 2000-2007

Fiscal year ending June	June 2002 forecast (\$millions)	September 2002 forecast (\$millions)	Change (\$millions) ¹	Change (%)
2000	64.4 ²	64.4 ²	0.0	0.0
2001	50.7 ²	50.7 ²	0.0	0.0
2002	49.1 ³	48.4 ⁴	-0.8	-1.5
2003	51.6 ³	51.1 ³	-0.5	-0.9
2004	50.3 ³	48.1 ³	-2.2	-4.4
2005	51.0 ³	51.4 ³	0.4	0.7
2006	55.5 ³	53.5 ³	-2.0	-3.6
2007	56.1 ³	56.1 ³	0.0	0.0
2002-07 ¹	313.6	308.6	-5.1	-1.6

Notes:

1. Totals may not add due to rounding.
2. Actual values.
3. Predicted values.
4. Preliminary value.

Figure 13: Nominal revenue flows to management accounts by account, 1989-2007



Note: FY 2002 estimates are preliminary

Table 13: Annual revenue flows to Upland and Aquatic Resource Management Cost Accounts, and the Forest Development Account, 2000-2007

Fiscal year ending June	Upland Resource Management Cost Account		Aquatic Resource Management Cost Account		Forest Development Account	
	September 2002 forecast (\$m illions)	Change from June 2002 forecast ¹ (\$m illions)	September 2002 forecast (\$m illions)	Change from June 2002 forecast ¹ (\$m illions)	September 2002 forecast (\$m illions)	Change from June 2002 forecast ¹ (\$m illions)
2000	30.9 ²	0.0	7.2 ²	0.0	26.4 ²	0.0
2001	24.9 ²	0.0	5.4 ²	0.0	20.5 ²	0.0
2002	22.2 ³	-0.7	6.4 ³	-0.3	19.8 ³	0.3
2003	23.8 ⁴	0.0	7.0 ⁴	0.1	20.4 ⁴	-0.6
2004	22.0 ⁴	-1.4	7.3 ⁴	0.1	18.8 ⁴	-0.9
2005	26.1 ⁴	1.7	7.5 ⁴	0.1	17.8 ⁴	-1.5
2006	26.7 ⁴	-0.9	7.8 ⁴	0.1	19.0 ⁴	-1.2
2007	29.2 ⁴	0.3	7.8 ⁴	0.2	19.1 ⁴	-0.5
2002-07 ¹	150.0	1.0	43.8	0.3	114.9	-4.4

Notes:

1. Totals may not add due to rounding.
2. FY 2000 through FY 2001 data are actual values.
3. Data for FY 2002 are preliminary values.

2. Revenue Flows To Trust Funds

After deduction of management expenses to the management funds, the remaining revenues are allocated to individual funds in one of three different fund groups: Current Funds, Aquatic Lands Funds, and Permanent Funds. Details of the forecast revenue flows to these individual funds are summarized in the appendix tables (Tables A1 through A5; see pages 55 through 59).

In accordance with market conditions and forecast assumptions, forecast revenue flows to all trust beneficiaries follow similar trends to revenue flows to the management accounts. Trust revenues net of management fees are forecast to increase from \$140 million in FY 2002 to \$150 million in FY 2003, before declining to \$139 million in FY 2004 (Table 14). Trust revenues are then forecast to increase through FY 2005 and FY 2006 to reach \$165 million in FY 2007. Compared with the June 2002 forecast, total revenues forecast for the entire FY 2002-2007 forecast period are estimated to be approximately \$18 million (2%) lower. Like the change in management fund revenues, this change reflects the effect of reduced forecast timber sale prices more than offsetting increased revenues from non-timber sources.

Table 14: Annual total trust revenues net of management fees--Comparison of September 2002 forecast with June 2002 forecast values, 2000-2007

Fiscal year ending June	June 2002 forecast (\$millions)	September 2002 forecast (\$millions)	Change (\$millions) ¹	Change (%)
2000	190.8 ²	190.8 ²	0.0	0.0
2001	152.1 ²	152.1 ²	0.0	0.0
2002	142.6 ³	140.2 ⁴	-2.4	-1.7
2003	152.0 ³	149.5 ³	-2.5	-1.6
2004	147.1 ³	139.4 ³	-7.8	-5.3
2005	148.7 ³	150.1 ³	1.4	0.9
2006	163.0 ³	156.4 ³	-6.6	-4.1
2007	165.2 ³	164.6 ³	-0.6	-0.4
2002-07 ¹	918.6	900.1	-18.5	-2.0

Notes:

1. Totals may not add due to rounding.
2. Actual values.
3. Predicted values.
4. Preliminary value.

SENSITIVITY ANALYSIS

Observing the effects of changes in the assumptions underlying the forecast can provide information regarding how sensitive the estimates are to these assumptions. Such knowledge is useful in interpreting the forecasts themselves, and in determining where modifications in the forecasting model and data will yield greatest improvements.

Timber revenues account for the largest share of total revenues, making it important to understand what factors have a major impact on this particular revenue stream. The key factors affecting forecasts of timber revenues are: (1) stumpage, i.e., standing sawtimber price; (2) sales volume; and (3) the rate at which timber is removed from both uncut timber under contract and new sales. Not all of these factors can be readily predicted, thus increasing the likelihood of marked fluctuations in projected revenues from forecast to forecast.

Sensitivity analysis indicates changes in stumpage have direct and proportional (though lagged) impacts on timber removal revenues through their effect on timber removal prices (Table 15). Timber removal volumes are apparently not sensitive to stumpage changes, but the validity of this response may be questionable insofar as stumpage changes may make removals from uncut inventory under contract more or less attractive to a purchaser.

Table 15: Effects on timber removal revenues of varying key forecast inputs, 2002-2007

Fiscal year ending June:	2002	2003	2004	2005	2006	2007
Sales prices increase 10%						
Removal volumes	0.0%	0.6%	-0.6%	-0.8%	0.0%	0.0%
Removal prices	0.0%	1.7%	6.1%	9.1%	10.0%	10.0%
Removal revenues	0.0%	2.3%	5.4%	8.3%	10.0%	10.0%
Sales prices decrease 10%						
Removal volumes	0.0%	-0.7%	0.8%	1.0%	0.0%	0.0%
Removal prices	0.0%	-1.5%	-6.2%	-9.2%	-10.0%	-10.0%
Removal revenues	0.0%	-2.2%	-5.4%	-8.3%	-10.0%	-10.0%
Sold volumes increase 10%						
Removal volumes	0.0%	5.7%	9.0%	10.0%	10.0%	10.0%
Removal prices	0.0%	1.8%	7.2%	9.6%	0.0%	0.0%
Removal revenues	0.0%	7.6%	16.9%	20.6%	10.0%	10.0%
Sold volumes decrease 10%						
Removal volumes	0.0%	-5.7%	-9.0%	-10.0%	-10.0%	-10.0%
Removal prices	0.0%	-0.9%	-6.5%	-9.4%	-0.0%	0.0%
Removal revenues	0.0%	-6.5%	-14.9%	-18.5%	-10.0%	-10.0%

Removal revenues are partly a lagged function of sales volumes with the impact of prior sales levels being felt for as many as three--and sometimes more--years. Changes in sales volumes have greater than proportional impacts on timber removal revenues two to three years out in the forecast period, because of feedback effects arising from the reduced sales prices. Specifically, reduced sales prices make uncut inventory under contract to the DNR a lower cost raw material input for milling compared with logs purchased on the domestic log market (in particular) or sawlogs imported from BC (to a lesser extent). Purchasers thus are forecast to remove a greater volume from uncut inventory under contract than would otherwise be the case. Note that these feedback effects are only captured in the removal revenue estimates for FY 2003 through FY 2005 on account of the forecasting method used (see pages 17 and 18). In reality, one could expect a less abrupt change in removal prices from FY 2005 to FY 2006 than is shown in Table 15.

ANALYSIS OF SELECTED SCENARIOS

The interaction of multiple changes in assumptions on timber removal revenues is illustrated in Table 16 for pessimistic and optimistic scenarios, with the current forecast providing the base-case benchmark for comparison. The pessimistic scenario assumes sales prices and sold timber volumes will decline by 10% in each year of the forecast period. The optimistic scenario assumes prices will increase by 10% in each year of the forecast period, but that sold timber volumes will remain unchanged. Estimates of potential changes in sold timber sales volumes for the optimistic and pessimistic scenarios were guided by preliminary results of the recalculation of the sustainable harvest.

In comparing pessimistic and optimistic scenarios, the estimated impacts on removal revenues are greatest for the pessimistic scenario. This result directly reflects the interaction in the pessimistic scenario of reduced price and sold timber sales volumes, as opposed to simply a price effect for the optimistic scenario. Furthermore, the impact of reducing both price and sold volume estimates in the pessimistic scenario has a disproportionate impact on removal revenues, acting through removal price. Feedback effects arising from the reduced sales prices are the reasons for this disproportionality, as noted above.

Table 16: Comparison with the base-case forecast scenario of changes in timber removal revenues for pessimistic and optimistic scenarios, 2003-2007

Fiscal year ending June:	2003	2004	2005	2006	2007
Pessimistic scenario ¹					
Sales volumes (change)	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%
Sales prices (change)	-10.0%	-10.0%	-10.0%	-10.0%	-10.0%
Removal volumes (change)	-6.4%	-8.2%	-9.1%	-10.0%	-10.0%
Removal prices (change)	-1.8%	-11.7%	-17.6%	-10.0%	-10.0%
Removal revenues (change)	-8.1%	-19.0%	-25.0%	-19.0%	-19.0%
Base-case scenario ^{2,4}					
Sales volumes (mmbf)	550	560	560	560	560
Sales prices (\$/mbf)	290	310	305	300	290
Removal volumes (mmbf)	532	505	527	532	558
Removal prices (\$/mbf)	303	287	295	303	303
Removal revenues (\$millions)	161.1	144.8	155.3	160.9	169.3
Optimistic scenario ³					
Sales volumes (change)	0.0%	0.0%	0.0%	0.0%	0.0%
Sales prices (change)	10.0%	10.0%	10.0%	10.0%	10.0%
Removal volumes (change)	0.6%	-0.6%	-0.8%	0.0%	0.0%
Removal prices (change)	1.7%	6.1%	9.1%	10.0%	10.0%
Removal revenues (change)	2.3%	5.4%	8.3%	10.0%	10.0%

Notes:

1. Pessimistic scenario: Sales prices and sold timber sale volumes decrease 10% for each year over the forecast period. No change in timber removal rate.
2. Base-case scenario: No change in prices or sales volume, and no change in timber removal rate.
3. Optimistic scenario: Prices increase 10% and timber sales volumes remain unchanged for each year over the forecast period. No change in timber removal rate.
4. Data for FY 2003 and subsequent years are predicted.

FORECAST CONFIDENCE

The philosophy of the forecast is to be as accurate as possible. Where judgment is required, the forecast is based on conservative assumptions so that, on balance, there is more potential for upward than downward changes in the revenue projections. In actuality, the precision of revenue estimates for any single trust or fund is much less than for the forecast as a whole.

Use of these forecast data for budgetary and other purposes needs to reflect the uncertainty surrounding this forecast. Major factors contributing to the uncertainty surrounding this September 2002 forecast include: (1) the outcome of legal challenges to timber sales offered by the department; (2) impacts on timber sale volumes of both changes in business practices and re-estimation of the sustainable harvest level for lands managed by the department; (3) impacts on domestic (US) log prices of restricting exports of softwood lumber from Canada into the USA; (4) military tensions in the Middle East, and their possible consequences (e.g., an expanding federal government deficit on account of increased defense expenditures, increased oil prices slowing economic activity); (5) interest rate movements in response to inflation and growth trends in the U.S. economy; and (6) future trends in consumer spending, particularly as influenced by consumer confidence. In addition to being vulnerable to unforeseen events (e.g., the Asian economic downturn, acts of terrorism), the forecast is also vulnerable to events that may be foreseeable in general but are difficult to predict specifically. Examples of these include the impacts of paralytic shellfish poisoning on geoduck revenue receipts, and impacts of introduced pathogens and pests, such as the spread of sudden oak death syndrome to Douglas fir trees in northern California (caused by the fungus *Phytophthora ramorum*) and the Asian longhorn beetle (*Anoplophora chinensis*) infestation near Tukwila in Washington). Marked fluctuations in forecast revenues are therefore possible from forecast to forecast, as evidenced by wide historical fluctuations in timber sales and removals, and timber prices. Such fluctuations tend to be the norm rather than the exception.

Because timber revenues constitute such a large proportion of total revenues from DNR's management activities, the confidence level in the forecast depends in large part upon the degree of confidence in several critical assumptions underpinning the timber component of the revenue forecasting model. These assumptions include:

1. Sales Volumes

Development and implementation of a multi-species habitat conservation program (HCP)⁸ has helped the department in managing its timber sales program. However, events beyond the control of the department may nevertheless impact the department's ability to meet its sales targets. These include new listings of endangered species (on forest lands in eastern Washington not covered by the department's HCP, although revenue flows from these lands are relatively small compared with revenues from western Washington forests), improvements in forest management data and information systems (e.g., definition of harvestable lands with respect to identifying streams requiring riparian protection), and legal and legislative actions.

⁸ The department's HCP was derived in response to the listing of certain wildlife species under the ESA. It provides a means for DNR to conform to the requirements of the ESA, and to discharge its obligations to trust beneficiaries, on whose behalf DNR manages assets in accord with certain specified obligations.

Assumptions about timber sales levels and subsequent timber revenues are also made with a degree of uncertainty. Much of this uncertainty is associated with whether target timber sales volumes will actually be achieved in practice, and what sales targets will be implemented and achieved following recalculation of the sustainable harvest. Some uncertainty is also attributable to limited knowledge of not only which trust lands will be harvested but also by the composition of future annual harvests (e.g., proportions of species, sawlogs, commercial thinnings, poles, salvage, etc.).

2. Sales Prices

Prices reflect relative supply and demand. The current forecast assumes that sales prices over the forecast period will tend to track overall levels of economic activity and the end-use demand for wood products, especially in the USA and Japan. Critical factors here include US interest rates, construction activity in Japan, currency fluctuations, and the competitiveness of, and market share held by, US forest products in both foreign and domestic markets. However, timber supply factors will also influence sales prices, in both short and long runs (e.g., composition of future annual harvests, marked and sometimes unanticipated sawtimber supply contractions affecting harvest levels on both public and private forestland, dynamics of sawtimber supply adjustments and elasticities).

Future policy governing North American softwood lumber trade is a potentially significant source of uncertainty surrounding the prices estimated in this forecast. Through causative linkages described elsewhere in this forecast (see pages 4 and 5) trade policy intervention, coupled with Japanese market conditions, will influence the quantities and forms of softwood lumber and logs imported into the USA from Canada and Europe, thus affecting domestic lumber prices and stumpages.

3. Removal Volumes

The implementation of a survey of purchasers' harvest intentions has significantly increased confidence in forecasting near-term removals from existing timber sales. Evaluation of how best to estimate removals from new, as yet unsold, sales continues, with recent efforts being incorporated into this forecast. These and future changes will be monitored to assess impacts on forecast accuracy and confidence.

REFERENCES

- Azuma, D.L., K.R. Birch, P. DelZotto, A.A. Herstrom, and G.J. Lettman. 1999. Land use change on non-federal land in western Oregon, 1973-1994. Oregon Department of Forestry. Salem, Oregon, USA.
- Binam, K. Various issues. Lumber track. Western Wood Products Association, Portland, Oregon, U.S.A.
- Binam, K. Various issues. Western lumber facts. Western Wood Products Association, Portland, Oregon, U.S.A.
- Blue Chip Economic Indicators. Various issues. Top analysts' forecasts of the U.S. economic outlook for the year ahead. Capitol Publications, Inc., Alexandria, Virginia, USA.
- CVA. Various issues. Macroeconomic outlook. Clear Vision Associates. San Rafael, California, USA.
- CVA. Various issues. Pulp and paper industry outlook. Clear Vision Associates. San Rafael, California, USA.
- CVA. Various issues. Timber and wood products industry outlook. Clear Vision Associates. San Rafael, California, USA.
- Glass, B.P. Various issues. Economic and revenue forecast. Washington State Department of Natural Resources, Olympia, Washington, USA.
- Japan Lumber Journal. Various issues. Tokyo, Japan.
- Japan Wood Products Information and Research Center. Various issues. Wood supply and demand information service. Seattle, Washington, USA.
- Parks, M.J. Various issues. Marple's business newsletter. Seattle, Washington, USA.
- RCW 79.90.465. 1996. 1996 Revised code of Washington. Volume 7. Statute Law Committee, State of Washington, Olympia, Washington, USA.
- RCW 79.90.480. 1996. 1996 Revised code of Washington. Volume 7. Statute Law Committee, State of Washington, Olympia, Washington, USA.
- RCW 82.33.020. 1996. 1996 Revised code of Washington. Volume 7. Statute Law Committee, State of Washington, Olympia, Washington, USA.
- RISI. Various issues. Timber review. Resource Information Systems, Inc. Bedford, Massachusetts, USA.

RISI. Various issues. Lumber commentary. Resource Information Systems, Inc. Bedford, Massachusetts, USA.

RISI. Various issues. Monthly economic commentary. Resource Information Systems, Inc. Bedford, Massachusetts, USA.

RISI. Various issues. Particleboard & MDF commentary. Resource Information Systems, Inc. Bedford, Massachusetts, USA.

RISI. Various issues. Structural panels commentary. Resource Information Systems, Inc. Bedford, Massachusetts, USA.

RISI. Various issues. Wood products review. Resource Information Systems, Inc. Bedford, Massachusetts, USA.

The Nikkei Weekly. Various issues. Nihon Keizai Shimbun, Inc. Tokyo, Japan.

Wall Street Journal. Various issues. Money rates. New York, New York, USA.

GLOSSARY

Biennium: The state's two year budget cycle. The current biennium (FY 2001-03) starts on July 1, 2001 and ends June 30, 2003. The FY 2003-05 biennium starts July 1, 2003 and ends June 30, 2005. The FY 2005-07 biennium starts July 1, 2005 and ends June 30, 2007. Each biennium is made up of two fiscal years, e.g., the FY 2001-03 biennium is made up of FY 2002 and FY 2003.

Board foot (lumber): The common measure of lumber production. One board foot is the equivalent of a board one foot wide, one foot long, and one inch thick. An eight foot long "two by four" contains five and one third board feet. There are twelve board feet in a cubic foot.

Board foot (Scribner): A measure of potential lumber volume of logs or standing timber, estimated using a designated log scale rule. The log volume is expressed in terms of the board footage of lumber which could be sawn from the particular size of log according to log scale rule. The Scribner log scale is the scale rule DNR uses when selling standing trees.

Fiscal year: The budget year for Washington state government, running from July 1 through June 30 of the following calendar year. Fiscal year 2003, for example, runs from July 1, 2002 to June 30, 2003. The first, second, third, and fourth quarters of the fiscal year fall at the ends of September, December, March, and June respectively.

Inventory: Uncut timber under contract, measured in terms of volume and/or value.

Medium density fiberboard: A panel manufactured from wood fibers combined with a resin or other binder and compressed with heat to a density of 31-50 pounds per cubic foot.

Mill conversion efficiency: Product output expressed as a proportion of raw material (wood) input.

New sale: A timber sale for which a sales contract has not yet been let.

Nominal values, prices, and revenues: Values, prices and revenues received in any given year, that have not been adjusted for inflation. This revenue forecast is in nominal terms.

Oriented strand board: A panel made of narrow strands of fiber oriented lengthwise or crosswise in layers, with a binder. May be used for interior or exterior applications.

Particleboard: Panel made from discrete particles of wood (as opposed to wood fibers), mixed with resin, and formed into a solid board under heat and pressure.

Plywood: Panel made by bonding thin sheets of wood (veneers) under pressure, with the grain direction of each veneer being at right angles to the adjacent veneer(s).

Pulpwood: Trees or logs used to manufacture wood chips. These trees and logs are usually of insufficient size and quality to allow them to be processed into lumber.

Remaining: Uncut timber remaining in a sold timber sales contract, measured in terms of volume and/or value.

Removal: Timber removed as part of a sold timber sales contract, measured in terms of volume and/or value.

Sawtimber: Trees or logs of sufficient size and quality that allows them to be processed into lumber or plywood, with wood chips (sometimes) being produced as a by-product.

Stumpage: The price of standing trees.

Timber sale: Sale of standing trees within a specified area for removal within a specified time frame, and subject to certain other contractual requirements. DNR receives payment for timber sales once the purchaser starts to remove timber from the sale.

Uncut timber under contract: That portion of a sold timber sale which has not been harvested.

APPENDIX

FORECAST PERFORMANCE: COMPARISON OF ACTUALS WITH FORECAST ESTIMATES

The end of a fiscal year is a convenient time to assess forecast performance. Such periodic assessments are useful for building forecast confidence. They also aid in interpreting the forecast estimates, and applying those estimates in policy, planning, and operational settings.

The following brief bullet points outline major inferences that can be drawn from the accompanying suite of charts. These charts compare the difference between various forecast estimates and actual values (expressed as a percentage difference) for selected forecast measures, and how these differences have changed over time from forecast to forecast.

Inferring forecast performance from these charts requires exercise of considerable caution. It is extremely tempting to take the following charts at face value, and assert the forecast was on or off the target at a certain time. However, this perspective overlooks the use of the forecast. The forecast paints a picture of the future at a given time, and that picture may or may not be realized for reasons both within and beyond departmental influence and control. One purpose of a forecast, though, is to prompt policy and/or managerial response, and an irony of forecasting is that responses resulting from a forecast may be deliberately directed at ensuring the forecast is not actually realized in practice.

Using the thin black lines in Figure A1 as guides, the charts may be interpreted as follows. For the forecast based on September 2001 base-line data, i.e., the November 2001 forecast, the target timber sale volume was 9% higher than was actually realized.

- *Timber sale volumes (Figure A1):* Tendency for target sales volume to be greater than realized volume.
- *Timber sales prices (Figure A2):* Pronounced tendency toward overestimation for the last two fiscal years.
- *Timber removal volumes (Figure A3):* Historical tendency toward underestimation, resulting from conservative removal rate assumption (i.e., removals are assumed to occur in the last year of the contract). More recent forecasts exhibit greater precision and less directional bias, i.e., estimation variability tends to diminish as realized outcome date is approached..
- *Timber removal prices (Figure A4):* Historical tendency toward overestimation, largely resulting from the tendency to overestimate timber sales prices.
- *Timber removal revenues (Figure A5):* Historical tendency toward underestimation, resulting from conservative removal rate assumption (i.e., removals are assumed to occur in the last year of the contract). More recent forecasts (especially for FY 02) have tended to overestimate timber removal revenues.

- *Agriculture & mineral revenues (Figure A6):* Forecast estimates show relatively little variation about the actual values (possibly because most revenue streams have little market exposure).
- *Commercial real estate revenues (Figure A7):* Historical tendency toward overestimation, but the more recent tendency is toward underestimation.
- *Aquatic revenues (Figure A8):* Tendency toward over rather than underestimation (except FY 2000). No forecast estimates available prior to September 1996, i.e., November 1996 forecast.
- *Total revenues (Figure A9):* Historical tendency toward underestimation. More recent forecasts (especially for FY 02) have tended to overestimate timber removal revenues.

Figure A1: Difference between target and actual timber sale volumes by fiscal year

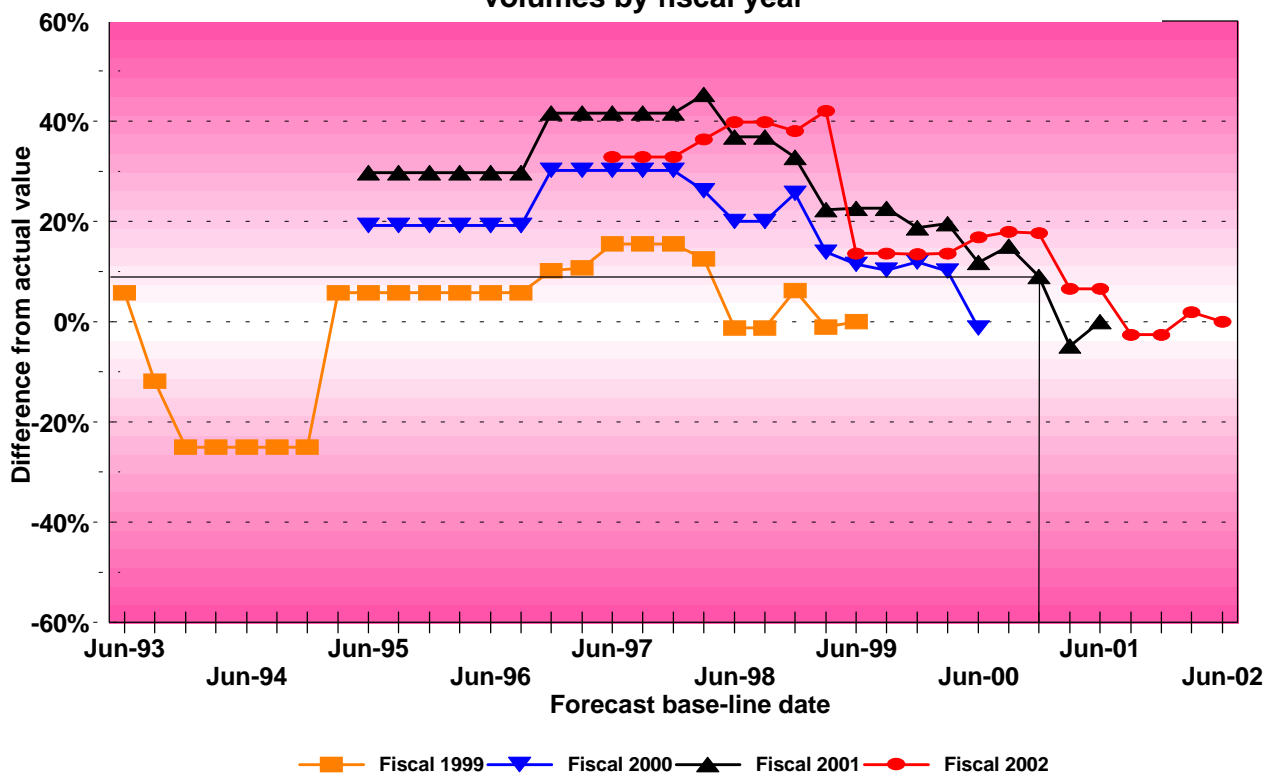


Figure A2: Difference between forecast and actual timber sale prices by fiscal year

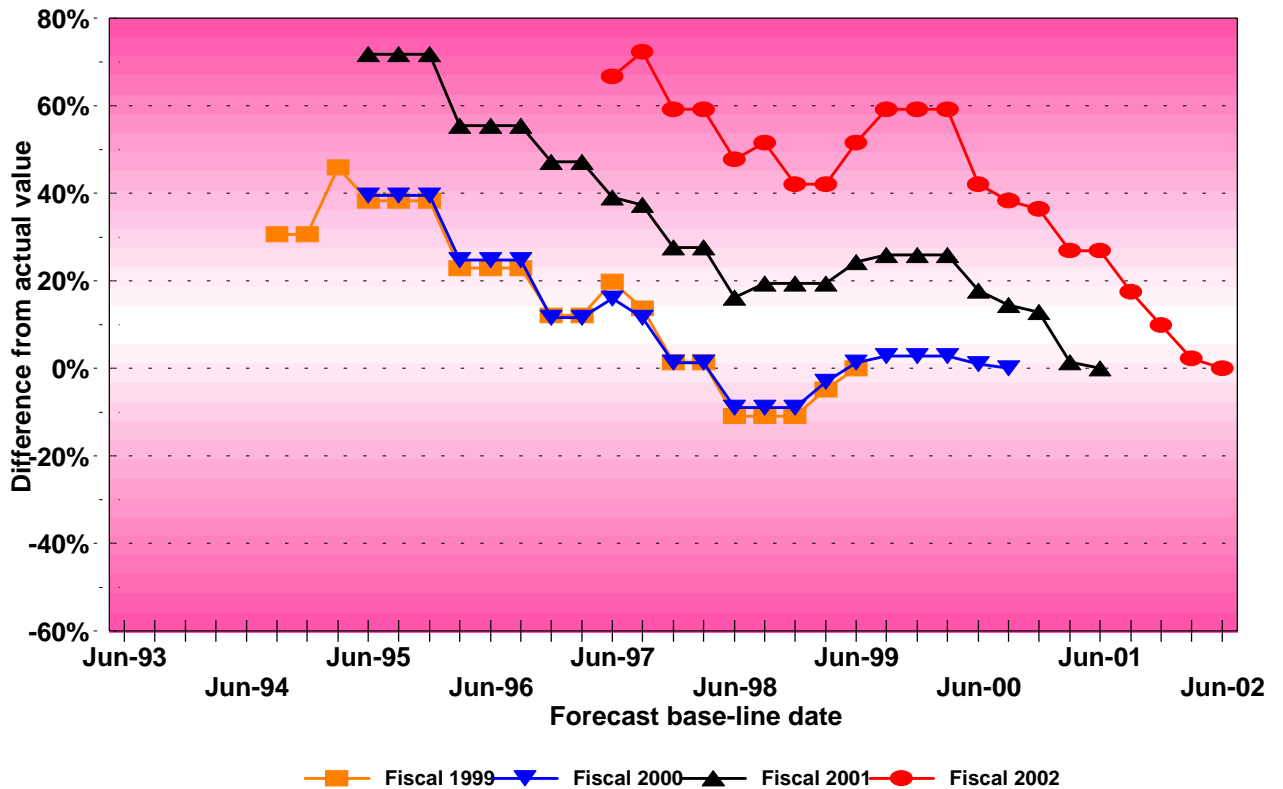


Figure A3: Difference between forecast and actual timber removal volumes by fiscal year

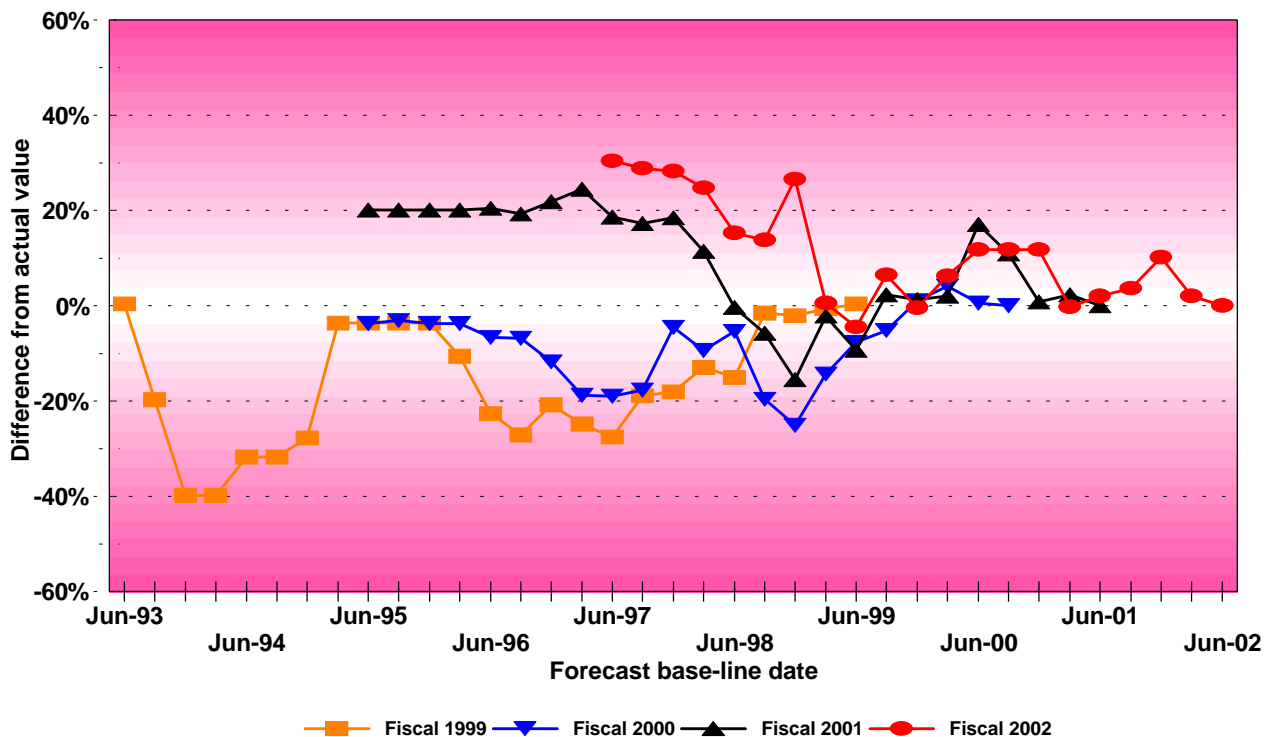


Figure A4: Difference between forecast and actual timber removal prices by fiscal year

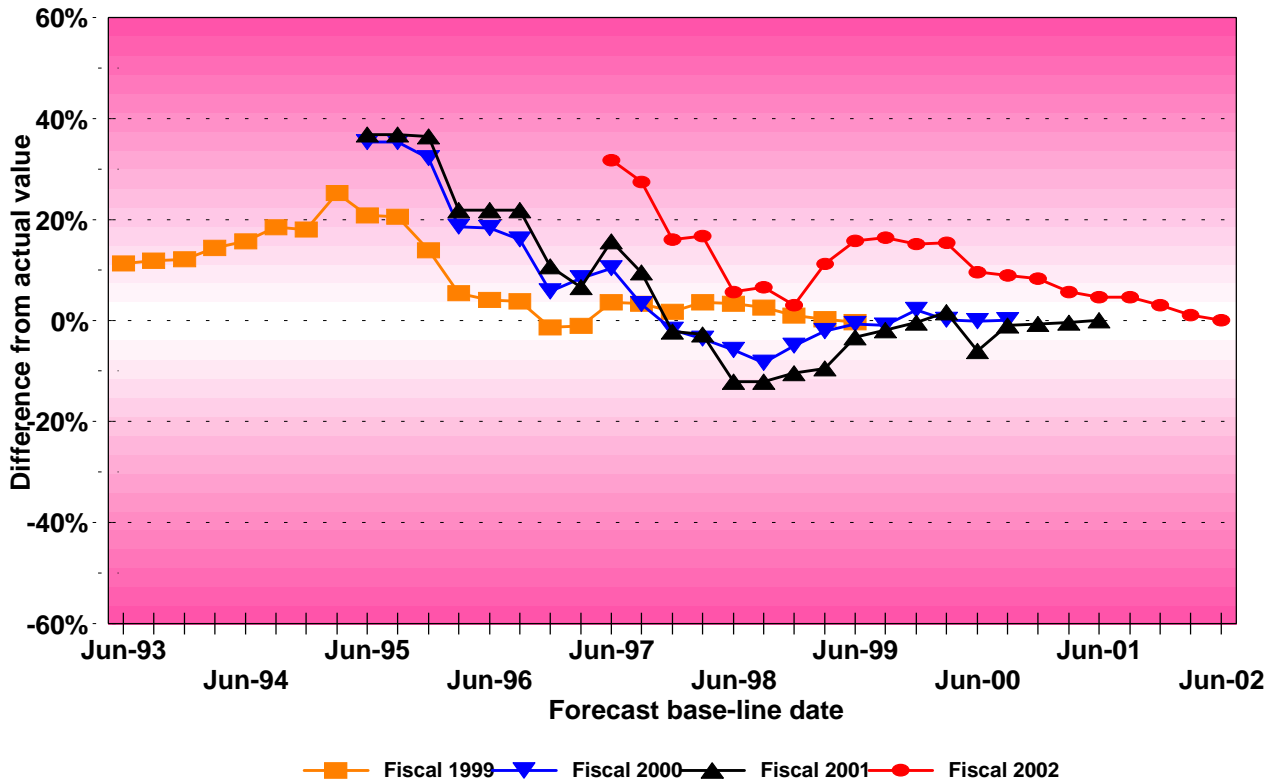


Figure A5: Difference between forecast and actual timber removal revenues by fiscal year

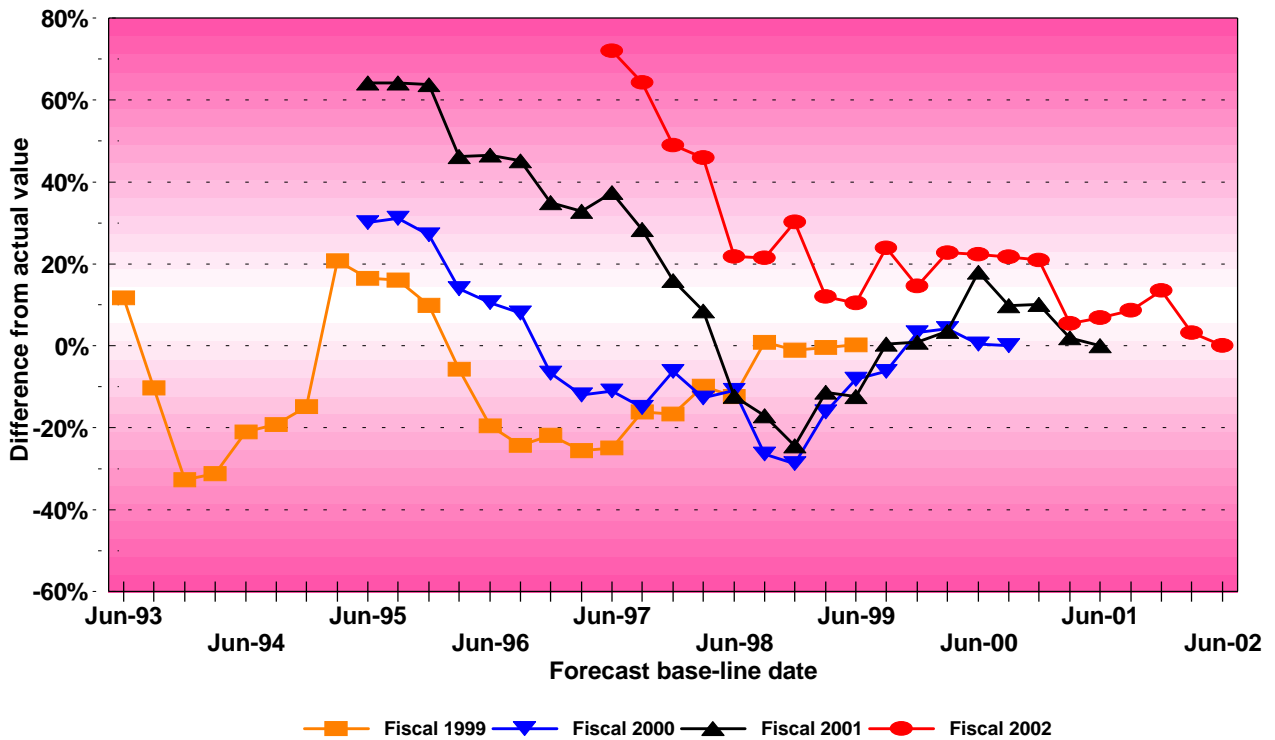


Figure A6: Difference between forecast and actual agricultural and mineral lease revenues by fiscal year

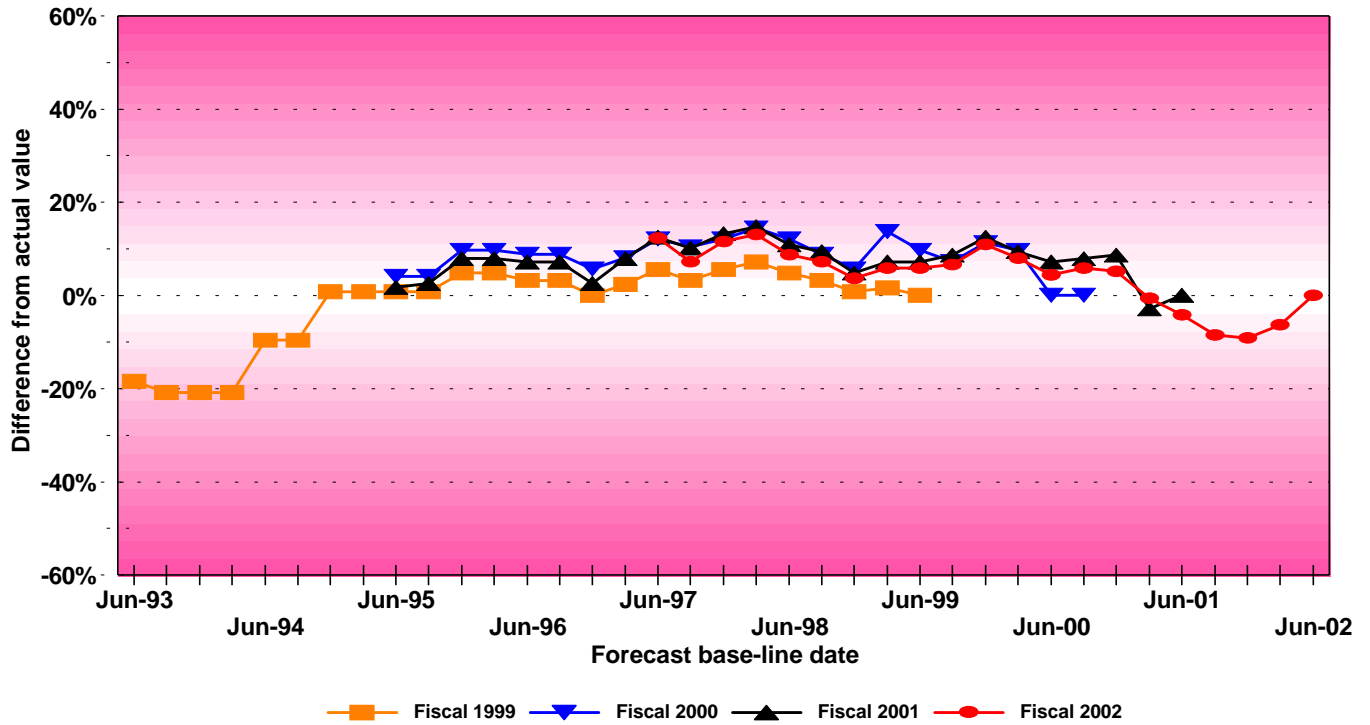


Figure A7: Difference between forecast and actual commercial real estate lease revenues by fiscal year

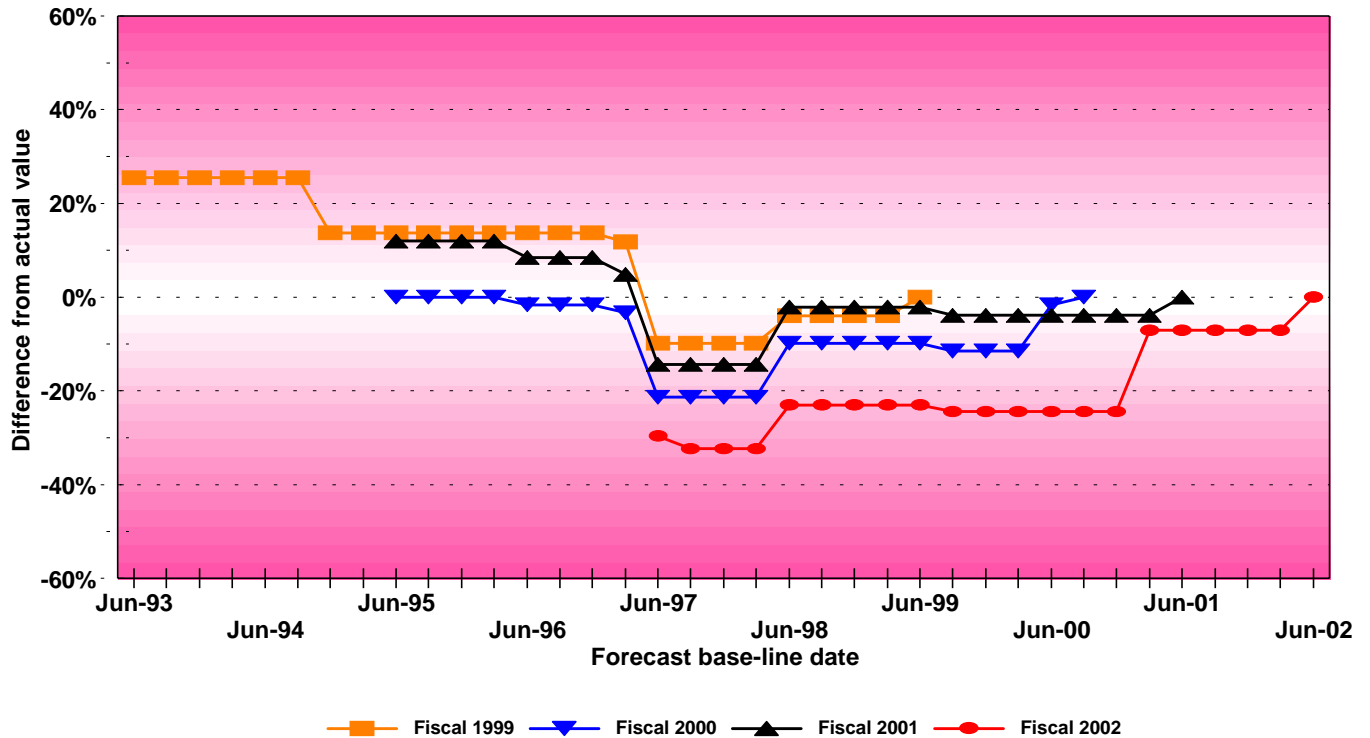


Figure A8: Difference between forecast and actual aquatic revenues by fiscal year

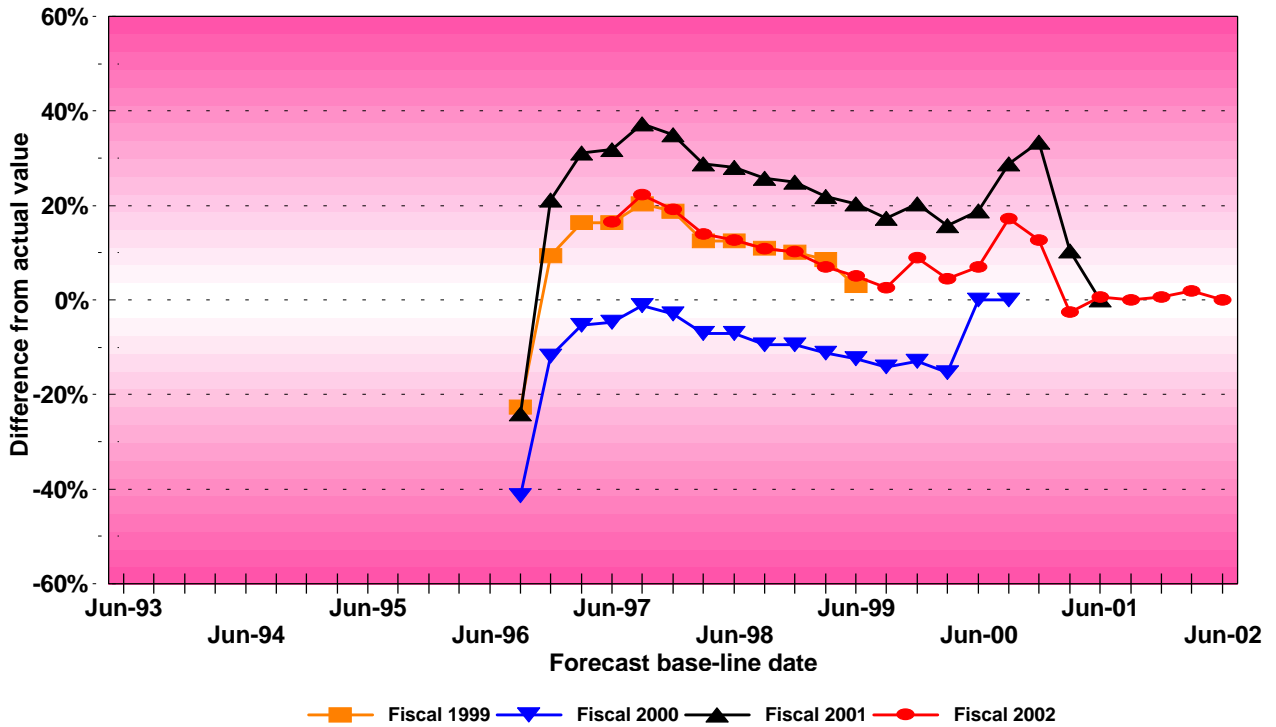


Figure A9: Difference between forecast and actual total revenues by fiscal year

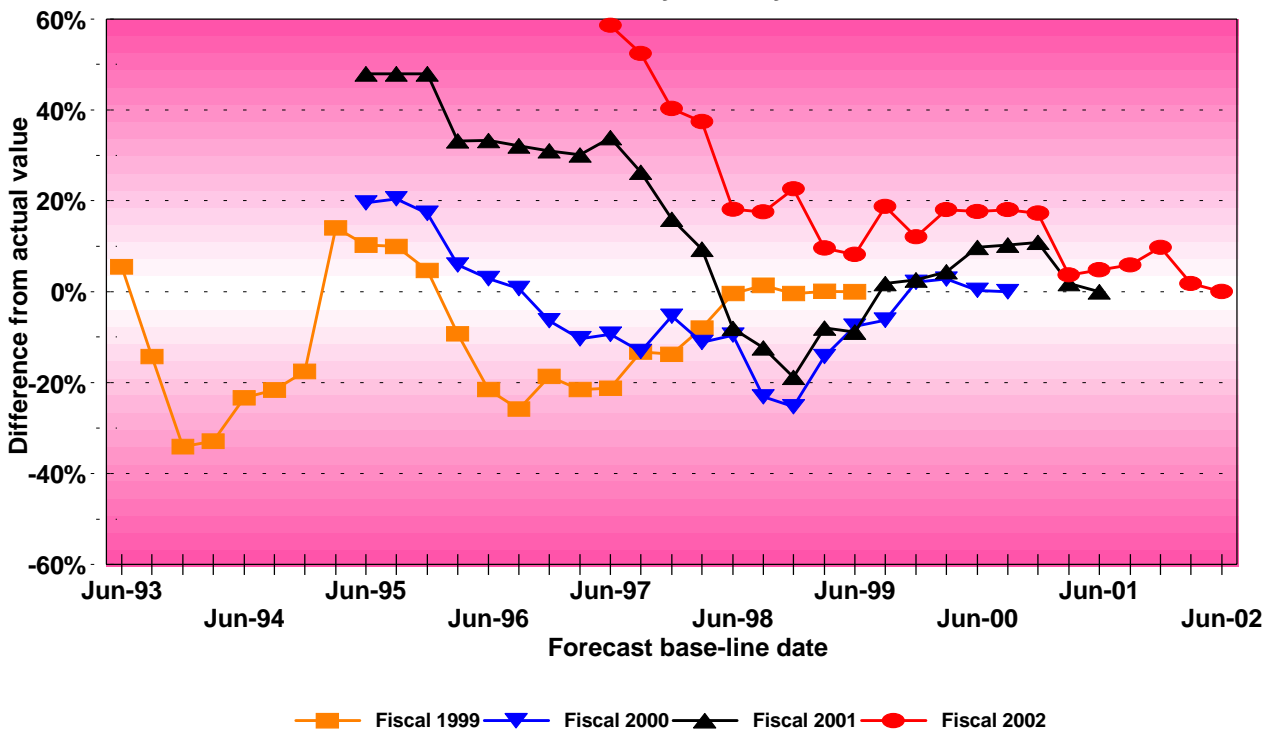


Table A1: Projected trust revenues by fund and fiscal year, June 2002 forecast, 2000-2007 (\$millions)

Fiscal year	2000	2001	Actual FY 2002 to 03/31/02	Projected 2002	Projected 2003	Projected 2004	Projected 2005	Projected 2006	Projected 2007
MANAGEMENT ACCOUNTS									
041 RMCA - UPLAND	\$30.9	\$24.8	\$17.5	\$22.9	\$23.8	\$23.4	\$24.4	\$27.6	\$28.9
041 RMCA - AQUATIC	\$7.2	\$5.4	\$4.5	\$6.6	\$6.9	\$7.1	\$7.4	\$7.6	\$7.7
014 FDA	\$26.4	\$20.5	\$13.9	\$19.6	\$20.9	\$19.7	\$19.2	\$20.2	\$19.6
	-----	-----	-----	-----	-----	-----	-----	-----	-----
	\$64.4	\$50.7	\$35.9	\$49.1	\$51.6	\$50.3	\$51.0	\$55.5	\$56.1
CURRENT FUNDS									
113 COMMON SCHOOL CONSTRUCTION	\$66.0	\$52.3	\$35.5	\$46.9	\$48.7	\$50.9	\$52.4	\$60.5	\$64.1
999 FOREST BOARD COUNTIES	\$81.0	\$64.0	\$40.7	\$58.7	\$64.2	\$59.4	\$58.2	\$62.6	\$60.4
001 GENERAL FUND	\$5.2	\$3.8	\$3.4	\$3.9	\$3.4	\$3.9	\$3.4	\$2.9	\$3.0
348 UNIVERSITY BOND RETIREMENT	\$0.3	\$1.1	\$0.4	\$0.9	\$1.2	\$1.1	\$1.1	\$1.4	\$1.5
347 WSU BOND REPAYMENT	\$0.5	\$0.6	\$0.8	\$0.7	\$0.7	\$0.8	\$0.8	\$0.9	\$0.9
042 CEP&RJ	\$5.1	\$3.6	\$2.3	\$3.8	\$6.2	\$5.0	\$5.0	\$4.4	\$4.3
036 CAPITOL BUILDING CONSTRUCTION	\$8.2	\$6.5	\$5.3	\$6.9	\$7.3	\$5.6	\$5.8	\$6.6	\$6.6
061/3/5/6 NORMAL (CWU, EWU, WWU, TESC) SCHOOL	\$0.1	\$0.1	\$0.0	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1
OTHER FUNDS	\$0.0	\$0.1	\$0.2	\$0.2	\$0.2	\$0.1	\$0.1	\$0.2	\$0.4
	-----	-----	-----	-----	-----	-----	-----	-----	-----
	\$166.4	\$132.2	\$88.7	\$122.0	\$131.9	\$126.8	\$127.0	\$139.5	\$141.3
AQUATIC LANDS ENHANCEMENT ACCOUNT									
02R AQUATIC LANDS	\$9.7	\$7.6	\$6.9	\$9.3	\$9.7	\$10.0	\$10.4	\$10.7	\$10.8
PERMANENT FUNDS									
601 AGRICULTURAL COLLEGE	\$2.6	\$1.8	\$0.9	\$1.4	\$3.0	\$3.3	\$3.1	\$3.5	\$3.8
604 NORMAL SCHOOL PERMANENT	\$5.5	\$4.3	\$3.5	\$4.2	\$2.0	\$2.8	\$2.8	\$3.2	\$3.2
605 COMMON SCHOOL PERMANENT	\$1.0	\$0.8	\$0.1	\$0.6	\$0.7	\$0.9	\$1.1	\$1.2	\$1.3
606 SCIENTIFIC PERMANENT	\$4.7	\$4.7	\$4.0	\$4.3	\$4.1	\$3.2	\$4.0	\$4.5	\$4.2
607 UNIVERSITY PERMANENT	\$1.0	\$0.6	\$0.6	\$0.7	\$0.5	\$0.2	\$0.3	\$0.4	\$0.6
	-----	-----	-----	-----	-----	-----	-----	-----	-----
	\$14.7	\$12.3	\$9.1	\$11.2	\$10.4	\$10.3	\$11.3	\$12.8	\$13.1
TOTAL TO TRUST BENEFICIARY FUNDS	\$190.8	\$152.1	\$104.6	\$142.6	\$152.0	\$147.1	\$148.7	\$163.0	\$165.2
TOTAL ALL FUNDS	\$255.3	\$202.8	\$140.5	\$191.7	\$203.5	\$197.4	\$199.8	\$218.5	\$221.3

Notes:

- 1 - Excludes interest and trust land transfer monies, and includes operating transfers. Trust Land Transfer monies amounted to \$37.3 million in FY 1994-95, \$21.8 million in FY 1998-99, \$56.06 million in FY 2000-01, and \$40.0 million (estimate) in FY 2002-03, payable to the Common School Construction Fund.
- 2 - Upland RMCA does not include land bank transactions.
- 3 - Revenues reflect cash earnings from management activities only. Revenues from interest payments, fires assessments, permits, fees, etc. are not included.
- 4 - Totals may not add due to rounding.
- 5 - Projected values are forecast estimates, and should be interpreted in conjunction with the accompanying forecast document. Unforeseen events and changes in future conditions may alter forecast estimates and results.
- 6 - Data for all years are cash estimates, and not directly comparable with accrual figures presented in DNR Annual Reports.

Table A2: Projected trust revenues by fund and fiscal year, September 2002 forecast, 2000-2007 (\$millions)

Fiscal year	2000	2001	Actual FY 2002 to 06/30/02	Preliminary 2002	Projected 2003	Projected 2004	Projected 2005	Projected 2006	Projected 2007
MANAGEMENT ACCOUNTS									
041 RMCA - UPLAND	\$30.9	\$24.9	\$22.1	\$22.2	\$23.8	\$22.0	\$26.1	\$26.7	\$29.2
041 RMCA - AQUATIC	\$7.2	\$5.4	\$6.4	\$6.4	\$7.0	\$7.3	\$7.5	\$7.8	\$7.8
014 FDA	\$26.4	\$20.5	\$19.9	\$19.8	\$20.4	\$18.8	\$17.8	\$19.0	\$19.1
	\$64.4	\$50.7	\$48.4	\$48.4	\$51.1	\$48.1	\$51.4	\$53.5	\$56.1
CURRENT FUNDS									
113 COMMON SCHOOL CONSTRUCTION	\$66.0	\$52.2	\$44.1	\$44.1	\$48.8	\$48.6	\$58.9	\$59.7	\$66.0
999 FOREST BOARD COUNTIES	\$81.0	\$64.0	\$58.9	\$58.5	\$61.4	\$56.3	\$54.7	\$59.4	\$59.1
001 GENERAL FUND	\$5.2	\$3.8	\$4.2	\$4.3	\$3.5	\$3.8	\$2.8	\$2.5	\$2.8
348 UNIVERSITY BOND RETIREMENT	\$0.3	\$1.1	\$0.5	\$0.5	\$1.3	\$0.9	\$1.4	\$1.3	\$1.5
347 WSU BOND REPAYMENT	\$0.5	\$0.7	\$1.1	\$0.8	\$0.9	\$0.9	\$1.0	\$1.0	\$1.1
042 CEP&RI	\$5.1	\$3.8	\$4.0	\$3.9	\$5.4	\$5.2	\$3.9	\$4.1	\$4.2
036 CAPITOL BUILDING CONSTRUCTION	\$8.2	\$6.5	\$7.6	\$7.6	\$6.8	\$5.0	\$5.4	\$6.1	\$6.2
061/3/5/6 NORMAL (CWU, EMU, WWU, TESC) SCHOOL	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1
OTHER FUNDS	\$0.0	\$0.1	\$0.2	\$0.2	\$0.1	\$0.1	\$0.3	\$0.2	\$0.4
	\$166.4	\$132.3	\$120.6	\$120.0	\$128.1	\$120.8	\$128.6	\$134.4	\$141.4
AQUATIC LANDS ENHANCEMENT ACCOUNT									
02R AQUATIC LANDS	\$9.7	\$7.6	\$9.3	\$9.3	\$9.8	\$10.1	\$10.5	\$10.8	\$10.9
PERMANENT FUNDS									
601 AGRICULTURAL COLLEGE	\$2.6	\$1.8	\$1.0	\$1.1	\$3.2	\$2.8	\$3.3	\$3.1	\$3.6
604 NORMAL SCHOOL PERMANENT	\$5.5	\$4.3	\$4.0	\$4.0	\$2.6	\$2.4	\$2.6	\$2.5	\$2.8
605 COMMON SCHOOL PERMANENT	\$1.0	\$0.8	\$0.2	\$0.9	\$0.7	\$0.9	\$1.1	\$1.2	\$1.2
606 SCIENTIFIC PERMANENT	\$4.7	\$4.7	\$4.2	\$4.3	\$4.5	\$2.2	\$3.6	\$4.0	\$4.1
607 UNIVERSITY PERMANENT	\$1.0	\$0.6	\$0.7	\$0.7	\$0.5	\$0.1	\$0.5	\$0.3	\$0.5
	\$14.7	\$12.2	\$10.1	\$10.9	\$11.6	\$8.4	\$11.0	\$11.1	\$12.2
TOTAL TO TRUST BENEFICIARY FUNDS	\$190.8	\$152.1	\$140.0	\$140.2	\$149.5	\$139.4	\$150.1	\$156.4	\$164.6
TOTAL ALL FUNDS	\$255.3	\$202.8	\$188.4	\$188.6	\$200.6	\$187.4	\$201.5	\$209.8	\$220.7

Notes:

- 1 - Excludes interest and trust land transfer monies, and includes operating transfers. Trust Land Transfer monies amounted to \$37.3 million in FY 1994-95, \$21.8 million in FY 1998-99, \$56.06 million in FY 2000-01, and \$40.0 million (estimate) in FY 2002-03, payable to the Common School Construction Fund.
- 2 - Upland RMCA does not include land bank transactions.
- 3 - Revenues reflect cash earnings from management activities only. Revenues from interest payments, fires assessments, permits, fees, etc. are not included.
- 4 - Totals may not add due to rounding.
- 5 - Projected values are forecast estimates, and should be interpreted in conjunction with the accompanying forecast document. Unforeseen events and changes in future conditions may alter forecast estimates and results.
- 6 - Data for all years are cash estimates, and not directly comparable with accrual figures presented in DNR Annual Reports.

Table A3: Change from June 2002 to September 2002 forecast-Projected trust revenues by fund and fiscal year, 2000-2007 (\$millions)

Fiscal year	2000	2001	Preliminary 2002	Projected 2003	Projected 2004	Projected 2005	Projected 2006	Projected 2007
MANAGEMENT ACCOUNTS								
041 RMCA - UPLAND	\$0.0	\$0.0	(\$0.7)	(\$0.0)	(\$1.4)	\$1.7	(\$0.9)	\$0.3
041 RMCA - AQUATIC	\$0.0	\$0.0	(\$0.3)	\$0.1	\$0.1	\$0.1	\$0.1	\$0.2
014 FDA	\$0.0	(\$0.0)	\$0.3	(\$0.6)	(\$0.9)	(\$1.5)	(\$1.2)	(\$0.5)
	-----	-----	-----	-----	-----	-----	-----	-----
	\$0.0	(\$0.0)	(\$0.8)	(\$0.5)	(\$2.2)	\$0.4	(\$2.0)	(\$0.0)
CURRENT FUNDS								
113 COMMON SCHOOL CONSTRUCTION	\$0.0	(\$0.1)	(\$2.9)	\$0.1	(\$2.3)	\$6.5	(\$0.8)	\$1.9
999 FOREST BOARD COUNTIES	\$0.0	\$0.0	(\$0.2)	(\$2.8)	(\$3.1)	(\$3.6)	(\$3.1)	(\$1.2)
001 GENERAL FUND	\$0.0	(\$0.0)	\$0.4	\$0.1	(\$0.0)	(\$0.5)	(\$0.4)	(\$0.2)
348 UNIVERSITY BOND RETIREMENT	\$0.0	\$0.0	(\$0.4)	\$0.1	(\$0.2)	\$0.4	(\$0.1)	\$0.1
347 WSU BOND REPAYMENT	\$0.0	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1
042 CEP&RI	\$0.0	\$0.2	\$0.1	(\$0.8)	\$0.2	(\$1.1)	(\$0.3)	(\$0.1)
036 CAPITOL BUILDING CONSTRUCTION	\$0.0	(\$0.0)	\$0.7	(\$0.5)	(\$0.7)	(\$0.4)	(\$0.5)	(\$0.4)
061/3/5/6 NORMAL (CWU, EWU, WWU, TESC) SCHOOL	\$0.0	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	\$0.0	\$0.0	\$0.0
OTHER FUNDS	\$0.0	(\$0.0)	\$0.0	(\$0.0)	(\$0.0)	\$0.2	(\$0.0)	(\$0.1)
	-----	-----	-----	-----	-----	-----	-----	-----
	\$0.0	\$0.1	(\$2.0)	(\$3.8)	(\$6.0)	\$1.6	(\$5.1)	\$0.1
AQUATIC LANDS ENHANCEMENT ACCOUNT								
02R AQUATIC LANDS	\$0.0	\$0.0	(\$0.0)	\$0.1	\$0.1	\$0.1	\$0.2	\$0.2
PERMANENT FUNDS								
601 AGRICULTURAL COLLEGE	\$0.0	(\$0.0)	(\$0.4)	\$0.2	(\$0.6)	\$0.1	(\$0.4)	(\$0.3)
604 NORMAL SCHOOL PERMANENT	\$0.0	(\$0.0)	(\$0.2)	\$0.6	(\$0.4)	(\$0.2)	(\$0.7)	(\$0.4)
605 COMMON SCHOOL PERMANENT	\$0.0	(\$0.1)	\$0.3	\$0.0	\$0.0	(\$0.0)	(\$0.0)	(\$0.0)
606 SCIENTIFIC PERMANENT	\$0.0	(\$0.1)	(\$0.0)	\$0.4	(\$0.9)	(\$0.4)	(\$0.5)	(\$0.1)
607 UNIVERSITY PERMANENT	\$0.0	(\$0.0)	(\$0.0)	(\$0.0)	(\$0.0)	\$0.2	(\$0.0)	(\$0.1)
	-----	-----	-----	-----	-----	-----	-----	-----
	\$0.0	(\$0.1)	(\$0.3)	\$1.2	(\$1.9)	(\$0.4)	(\$1.7)	(\$0.9)
TOTAL TO TRUST BENEFICIARY FUNDS	\$0.0	\$0.0	(\$2.4)	(\$2.5)	(\$7.8)	\$1.4	(\$6.6)	(\$0.6)
TOTAL ALL FUNDS	\$0.0	\$0.0	(\$3.2)	(\$2.9)	(\$10.0)	\$1.7	(\$8.6)	(\$0.6)

Notes:

- 1 - Excludes interest and trust land transfer monies, and includes operating transfers. Trust Land Transfer monies amounted to \$37.3 million in FY 1994-95, \$21.8 million in FY 1998-99, \$56.06 million in FY 2000-01, and \$40.0 million (estimate) in FY 2002-03, payable to the Common School Construction Fund.
- 2 - Upland RMCA does not include land bank transactions.
- 3 - Revenues reflect cash earnings from management activities only. Revenues from interest payments, fires assessments, permits, fees, etc. are not included.
- 4 - Totals may not add due to rounding.
- 5 - Projected values are forecast estimates, and should be interpreted in conjunction with the accompanying forecast document. Unforeseen events and changes in future conditions may alter forecast estimates and results.
- 6 - Data for all years are cash estimates, and not directly comparable with accrual figures presented in DNR Annual Reports.

Table A4: Change from June 2002 to September 2002 forecast-Projected trust revenues by fund and fiscal year, 2000-2007 (%)

Fiscal year	2000	2001	Preliminary 2002	Projected 2003	Projected 2004	Projected 2005	Projected 2006	Projected 2007
MANAGEMENT ACCOUNTS								
041 RMCA - UPLAND	0.0%	0.0%	-3.2%	-0.0%	-6.0%	7.0%	-3.4%	1.2%
041 RMCA - AQUATIC	0.0%	0.0%	-4.3%	1.3%	1.5%	1.7%	1.9%	2.0%
014 FDA	0.0%	-0.0%	1.3%	-2.6%	-4.7%	-7.7%	-5.9%	-2.6%
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	0.0%	-0.0%	-1.5%	-0.9%	-4.4%	0.7%	-3.6%	-0.0%
CURRENT FUNDS								
113 COMMON SCHOOL CONSTRUCTION	0.0%	-0.2%	-6.1%	0.2%	-4.5%	12.4%	-1.4%	3.0%
999 FOREST BOARD COUNTIES	0.0%	0.0%	-0.4%	-4.4%	-5.2%	-6.1%	-5.0%	-2.1%
001 GENERAL FUND	0.0%	-0.1%	9.6%	3.5%	-0.6%	-16.1%	-13.3%	-8.1%
348 UNIVERSITY BOND RETIREMENT	0.0%	1.0%	-41.2%	6.1%	-22.1%	32.5%	-4.9%	6.4%
347 WSU BOND REPAYMENT	0.0%	12.0%	22.5%	19.6%	17.2%	16.9%	15.6%	16.3%
042 CEP&RI	0.0%	4.3%	3.9%	-13.6%	3.9%	-21.7%	-6.4%	-2.0%
036 CAPITOL BUILDING CONSTRUCTION	0.0%	-0.0%	10.7%	-7.0%	-11.8%	-6.4%	-7.3%	-6.2%
061/3/5/6 NORMAL (CWU, EWU, WWU, TESC) SCHOOL	0.0%	-11.0%	-15.0%	-9.8%	-5.0%	3.7%	6.8%	11.3%
OTHER FUNDS	0.0%	-1.7%	7.6%	-19.6%	-16.0%	124.2%	-18.4%	-13.3%
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	0.0%	0.1%	-1.7%	-2.8%	-4.7%	1.3%	-3.6%	0.1%
AQUATIC LANDS ENHANCEMENT ACCOUNT								
02R AQUATIC LANDS	0.0%	0.0%	-0.1%	0.9%	1.1%	1.2%	1.4%	1.5%
PERMANENT FUNDS								
601 AGRICULTURAL COLLEGE	0.0%	-0.2%	-25.6%	5.9%	-16.7%	4.6%	-12.3%	-7.7%
604 NORMAL SCHOOL PERMANENT	0.0%	-0.0%	-4.0%	30.6%	-14.0%	-8.3%	-22.5%	-11.8%
605 COMMON SCHOOL PERMANENT	0.0%	-6.8%	43.8%	3.1%	0.7%	-1.6%	-2.5%	-3.1%
606 SCIENTIFIC PERMANENT	0.0%	-1.5%	-0.9%	9.9%	-29.6%	-10.8%	-10.3%	-3.4%
607 UNIVERSITY PERMANENT	0.0%	-0.3%	-5.8%	-2.0%	-16.1%	61.8%	-12.4%	-9.9%
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	0.0%	-1.1%	-3.0%	11.7%	-18.5%	-3.2%	-13.2%	-6.9%
TOTAL TO TRUST BENEFICIARY FUNDS	0.0%	0.0%	-1.7%	-1.6%	-5.3%	0.9%	-4.1%	-0.4%
TOTAL ALL FUNDS	0.0%	0.0%	-1.6%	-1.4%	-5.0%	0.9%	-3.9%	-0.3%

Notes:

- 1 - Excludes interest and trust land transfer monies, and includes operating transfers. Trust Land Transfer monies amounted to \$37.3 million in FY 1994-95, \$21.8 million in FY 1998-99, \$56.06 million in FY 2000-01, and \$40.0 million (estimate) in FY 2002-03, payable to the Common School Construction Fund.
- 2 - Upland RMCA does not include land bank transactions.
- 3 - Revenues reflect cash earnings from management activities only. Revenues from interest payments, fires assessments, permits, fees, etc. are not included.
- 4 - Totals may not add due to rounding.
- 5 - Projected values are forecast estimates, and should be interpreted in conjunction with the accompanying forecast document. Unforeseen events and changes in future conditions may alter forecast estimates and results.
- 6 - Data for all years are cash estimates, and not directly comparable with accrual figures presented in DNR Annual Reports.

Table A5: Revenue projections by fund and biennium, September 2002 forecast, 1995-2007 (\$millions)

Fiscal years	1995-97	1997-99	1999-2001	Biennium to 06/30/02	Preliminary 2001-2003	Preliminary 2003-2005	Preliminary 2005-2007
MANAGEMENT ACCOUNTS							
041 RMCA - UPLAND	\$79.9	\$65.4	\$55.7	\$22.1	\$46.0	\$48.1	\$55.9
041 RMCA - AQUATIC	\$10.0	\$11.3	\$12.5	\$6.4	\$13.3	\$14.8	\$15.6
014 FDA	\$74.2	\$56.9	\$46.9	\$19.9	\$40.2	\$36.5	\$38.1
	\$164.1	\$133.6	\$115.1	\$48.4	\$99.5	\$99.5	\$109.6
CURRENT FUNDS							
113 COMMON SCHOOL CONSTRUCTION	\$166.4	\$133.6	\$118.3	\$44.1	\$92.8	\$107.6	\$125.7
999 FOREST BOARD COUNTIES	\$195.1	\$172.9	\$145.0	\$58.9	\$119.9	\$111.0	\$118.6
001 GENERAL FUND	\$14.4	\$11.7	\$9.1	\$4.2	\$7.7	\$6.7	\$5.3
348 UNIVERSITY BOND RETIREMENT	\$4.3	\$3.3	\$1.4	\$0.5	\$1.8	\$2.3	\$2.8
347 WSU BOND REPAYMENT	\$0.9	\$1.1	\$1.2	\$1.1	\$1.7	\$1.9	\$2.1
042 CEP&RI	\$17.3	\$10.4	\$8.8	\$4.0	\$9.3	\$9.1	\$8.3
036 CAPITOL BUILDING CONSTRUCTION	\$11.5	\$13.8	\$14.7	\$7.6	\$14.4	\$10.4	\$12.3
061/3/5/6 NORMAL (CWU, EWU, WWU, TESC) SCHOOL	\$0.2	\$0.1	\$0.1	\$0.1	\$0.2	\$0.2	\$0.2
OTHER FUNDS	\$0.1	\$0.2	\$0.1	\$0.2	\$0.4	\$0.4	\$0.6
	\$410.2	\$347.2	\$298.7	\$120.6	\$248.1	\$249.5	\$275.8
AQUATIC LANDS ENHANCEMENT ACCOUNT							
02R AQUATIC LANDS	\$14.2	\$15.3	\$17.3	\$9.3	\$19.1	\$20.6	\$21.8
PERMANENT FUNDS							
601 AGRICULTURAL COLLEGE	\$9.6	\$7.0	\$4.4	\$1.0	\$4.3	\$6.0	\$6.6
604 NORMAL SCHOOL PERMANENT	\$7.5	\$7.1	\$9.8	\$4.0	\$6.7	\$5.0	\$5.3
605 COMMON SCHOOL PERMANENT	\$1.8	\$1.8	\$1.8	\$0.2	\$1.6	\$1.9	\$2.4
606 SCIENTIFIC PERMANENT	\$15.0	\$14.8	\$9.3	\$4.2	\$8.7	\$5.8	\$8.1
607 UNIVERSITY PERMANENT	\$4.8	\$2.9	\$1.6	\$0.7	\$1.2	\$0.6	\$0.9
	\$38.7	\$33.6	\$26.9	\$10.1	\$22.5	\$19.4	\$23.3
TOTAL TO TRUST BENEFICIARY FUNDS	\$463.1	\$396.1	\$342.9	\$140.0	\$289.7	\$289.5	\$320.9
TOTAL ALL FUNDS	\$627.1	\$529.7	\$458.1	\$188.4	\$389.2	\$388.9	\$430.5

Notes:

- 1 - Excludes interest and trust land transfer monies, and includes operating transfers. Trust Land Transfer monies amounted to \$37.3 million in FY 1994-95, \$21.8 million in FY 1998-99, \$56.06 million in FY 2000-01, and \$40.0 million (estimate) in FY 2002-03, payable to the Common School Construction Fund.
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